

Bulletin

Entomological Society of Canada
Soci t  d'entomologie du Canada

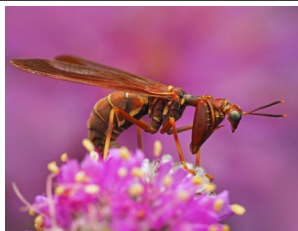
Volume 55
Number / num ro 4



December / d cembre 2023

Published quarterly by the
Entomological Society of Canada

Publication trimestrielle par la
Soci t  d'entomologie du Canada



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I'm an entomologist. That's my vocational identity anyway, and the fact that my PhD diploma says so explicitly is a source of pride. While studying at the University of Illinois to become that entomologist, it was a no-brainer that I should be a member of the national professional society; it was equally obvious that I should attend my professional society's annual national meetings: I just figured that's what entomologists do. But even as my vocational identity drew me to the Entomological Society of America, so did membership reinforce that nascent identity.

When **I brought my professional identity to Canada in 2012**, it was natural that I immediately become a member of the Entomological Society of Canada. Employed by the University of Montreal, it was just as natural that I become a member of the Société d'Entomologie du Québec. I can rightfully claim to be a systematist (**I study aphid taxonomy, *sensu latissimo***), but I never found a home in evolution or systematics professional societies. I find I have more in common with insect physiologists, insect pest managers, and insect ecologists than I do with vertebrate systematists, evolutionary biologists, or biodiversity scientists.

It was in the last ten years or so that I learned many people who work with insects do not consider themselves entomologists. **How about you?** Does "entomologist" describe your vocational or avocational identity? Are you a member of the ESC because you think of yourself as an entomologist, or does membership give you a sentiment of being an

Je suis entomologiste. C'est en tout cas mon identité professionnelle, et le fait que mon diplôme de doctorat l'indique explicitement est une source de fierté. Lorsque j'étudiais à l'université de l'Illinois pour devenir entomologiste, il allait de soi que je devais être membre de la société professionnelle nationale; il était tout aussi évident pour moi que je devais assister aux réunions nationales annuelles de ma société professionnelle : je me suis dit que c'était ce que faisaient les entomologistes. Mais alors même que mon identité professionnelle m'attirait vers la Société d'entomologie d'Amérique (ESA), mon statut de membre renforçait cette identité naissante.

Lorsque **j'ai apporté mon identité professionnelle au Canada en 2012**, il était naturel que je devienne immédiatement membre de la Société d'entomologie du Canada. Employé par l'Université de Montréal, il était tout aussi naturel que je devienne membre de la Société d'entomologie du Québec. Je peux à juste titre prétendre être un systématicien (**j'étudie la taxonomie des pucerons, *sensu latissimo***), mais je n'ai jamais trouvé ma place dans les sociétés professionnelles d'évolution ou de systématique. Je trouve que j'ai plus en commun avec les physiologistes des insectes, les spécialistes de la gestion des ravageurs et les écologistes des insectes qu'avec les systématiciens des vertébrés, les biologistes de l'évolution ou les spécialistes de la biodiversité.

C'est au cours des dix dernières années environ que j'ai appris que de nombreuses personnes travaillant avec des insectes ne se considèrent pas comme des entomologistes. **Qu'en est-il pour vous?** Le terme « entomologiste » décrit-il votre identité professionnelle ou non? Êtes-vous membre de

entomologist? What about your colleagues who work with insects but aren't members of the ESC? If they don't think of themselves as entomologists, might they if they became members? If not, why not?

These questions are germane to the ESC's current situation. At our recent and successful Joint Annual Meeting, hosted by the Entomological Society of Saskatchewan, your board of directors began developing a strategic plan for the ESC. With input from the regional societies and the ESC membership, the board aims to submit the strategic plan for membership ratification at the 2024 Joint Annual Meeting in Quebec City. Over the coming year, as we build a new common vision, a critical question is **Who does our Society serve?** Is it ESC members, is it entomologists, is it people working (or playing!) with insects? Whatever the answer, we might hope that whoever is served by and benefits from the work of the Society would want to become a member (and if they do become a member, why not also proudly wear the badge "entomologist"!).

The Entomological Society of Canada turned 160 years old this year, twice a Canadian's life expectancy at birth. Our venerable institution is steeped in and has been shaped by history, but it's future is not guaranteed. Who knows how long it will continue to unite and work on behalf of Canada's entomologists? Is the ESC reaching retirement age, is it middle-aged, or is it still in the flush of youth? I hope that question remains unanswered during my lifetime, but ultimately, it will come down to two factors: (1) time and (2) we the Society's membership.

Much has changed in 160 years but the shifts over the past few have been particularly abrupt. **The timing is perfect for a reimagining of the ESC.** After ratifying the strategic plan, the following year we will review the Society's activities, including its committees and standing rules, ensuring they are in alignment with the strategic plan. We are also currently reviewing the future of Joint Annual Meetings, considering

la SEC parce que vous vous considérez comme un entomologiste, ou l'adhésion vous donne-t-elle le sentiment d'être un entomologiste? Qu'en est-il de vos collègues qui travaillent avec des insectes mais qui ne sont pas membres de la SEC? Si ces personnes ne se considèrent pas comme des entomologistes, pourraient-elles le faire si elles devenaient membres? Si ce n'est pas le cas, pourquoi?

Ces questions sont en rapport avec la situation actuelle de la SEC. Lors de notre récente et fructueuse réunion annuelle conjointe, organisée par la Société d'entomologie de la Saskatchewan, votre CA a commencé à élaborer un plan stratégique pour la SEC. Avec la contribution des sociétés régionales et des membres de la SEC, le CA vise à soumettre le plan stratégique à la ratification des membres lors de la réunion annuelle conjointe de 2024 à Québec. Au cours de l'année à venir, alors que nous construisons une nouvelle vision commune, une question essentielle se pose : **Qui notre Société sert-elle?** S'agit-il des membres de la SEC, des entomologistes, des personnes qui travaillent (ou jouent!) avec les insectes? Quelle que soit la réponse, nous pouvons espérer que toute personne bénéficiant du travail de la Société voudra en devenir membre (et si elle le devient, pourquoi ne pas porter fièrement l'insigne « d'entomologiste »!).

La Société d'entomologie du Canada a eu 160 ans cette année, soit deux fois l'espérance de vie d'un Canadien ou d'une Canadienne à la naissance. Notre vénérable institution est ancrée dans l'histoire et a été façonnée par elle, mais son avenir n'est pas garanti. Qui sait combien de temps elle continuera à unir et à travailler au nom des entomologistes du Canada? La SEC arrive-t-elle à l'âge de la retraite, est-elle d'âge moyen ou est-elle encore dans la fleur de l'âge? J'espère que cette question restera sans réponse de mon vivant, mais en fin de compte, elle se résumera à deux facteurs : (1) le temps et (2) les membres de la Société.

Beaucoup de choses ont changé en 160 ans, mais les changements survenus au cours

alternative models of in-person and virtual conferences. This is an exciting time for the Society: we can reimagine it in many ways. I say let's make it the envy of our colleagues; let's make anyone working with insects want to join us; let's make membership a no-brainer. **Dear entomologists, you can help make this happen!** You can play your part immediately: run for office, volunteer for a committee, nominate a colleague for an achievement award.* And if now is not the right time, please thank your colleagues on committees and on the board for their service. Your representatives will appreciate your kind words and welcome your ideas for the present and future of our common heritage.

des dernières années ont été particulièrement brutaux. **Le moment est idéal pour redéfinir la SEC.** Après avoir ratifié le plan stratégique, nous examinerons l'année suivante les activités de la Société, y compris ses comités et ses Règles permanentes, en veillant à ce qu'elles soient alignées sur le plan stratégique. Nous sommes également en train d'examiner l'avenir des réunions annuelles conjointes, en envisageant des modèles alternatifs de conférences en personne et virtuelles. C'est une période passionnante pour la Société : nous pouvons la réimaginer de nombreuses façons. Faisons en sorte qu'elle fasse l'envie de nos collègues, que tous ceux qui travaillent sur les insectes aient envie de nous rejoindre, que l'adhésion soit une évidence. **À vous, entomologistes, vous pouvez contribuer à la réalisation de cet objectif!** Vous pouvez jouer votre rôle immédiatement : présentez-vous à un poste, devenez bénévole dans un comité, nommez une personne pour un prix d'excellence.* Et si ce n'est pas le bon moment, remerciez vos collègues des comités et du CA pour leurs services. Les personnes vous représentant apprécieront vos bons mots et accueilleront avec plaisir vos idées pour le présent et l'avenir de notre patrimoine commun.

* We have an immediate need for chairs of the Insect Common Names, Public Education, Membership, and Science Policy committees, and a co-chair of the Communications committee. The Member's Area at <https://esc-sec.ca/> includes committee descriptions. We are also seeking a person to join Erin Campbell as co-Secretary of the ESC and one to join Bernie Roitberg as Assistant *Bulletin* Editor. Please contact me at ESCPresident@esc-sec.ca for more information or to join the team! Nominating committee chair Chris MacQuarrie and Achievement Awards committee chair Christine Noronha will also be looking for engagement later this Societal term.

* Nous avons un besoin immédiat de personnes pour présider les comités des noms communs d'insectes, de l'éducation du public, des membres et de la politique scientifique, ainsi que pour coprésider le comité de la communication. L'espace membres de la SEC, à l'adresse <https://esc-sec.ca/>, contient des descriptions des comités. Nous recherchons également une personne pour rejoindre Erin Campbell en tant que cosecraétaire de la SEC et une personne pour rejoindre Bernie Roitberg en tant que rédactrice adjointe. Veuillez me contacter à l'adresse ESCPresident@esc-sec.ca pour de plus amples informations ou pour rejoindre l'équipe! Chris MacQuarrie, président du comité des nominations, et Christine Noronha, présidente du comité des prix d'excellence, seront également à la recherche d'un engagement plus tard au cours de ce mandat sociétal.

ESC Achievement & Service Awards
Prix d'excellence et de service de la SEC



T. Wist

Maya Evenden (right) receiving the Gold Medal from Chris MacQuarrie (left).



T. Wist

Maya Evenden delivering the Gold Medal Address



T. Wist

Boyd Mori (right) receiving the C. Gordon Hewitt Award from Chris MacQuarrie (left)



T. Wist

Kiara Calladine (left) receiving the Norman Criddle Award from Chris MacQuarrie right)



T. Wist

Chris MacQuarrie (left) receiving his Service Award from Colin Favret (right)



T. Wist

Neil Holliday (right) receiving his Service Award from Colin Favret (left).



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STEP Corner / Le coin de la relève

Rowan French and Matt Muzzatti



Annual Meeting

The Entomological Society of Saskatchewan and the Entomological Society of Canada hosted the 2023 Joint Annual Meeting in Saskatoon, 15 -18 October 2023.

SEPAC members organized and facilitated the silent auction and raised **\$1620** towards ESC student scholarships. Thank you to everyone who donated and bid on items. Special thank you to Catherine Scott for setting up the auction and for managing item pick-up!

SEPAC organized another fantastic **Graduate Student Showcase (GSS)** at the meeting. The GSS is a high-profile opportunity for ESC student members who have defended or plan to defend their thesis at a Canadian University within one year of the meeting to give 30-minute keynote presentations. Congratulations to the 2023 GSS awardees:

Aaron Bell, University of Saskatchewan, Phillips Lab. PhD Thesis / Thèse de PhD : Temporal and spatial pyrodiversity, not island area or nearness, begets biodiversity of beetles on boreal lake islands.

Saif Nayani, Simon Fraser University, Gries Lab. MSc Thesis / Mémoire de MSc : Bovine mastitis, *Staphylococcus aureus* and stable flies: Evidence for a (not so positive) positive feedback loop.

Asim Reynard, Simon Fraser University, Gries Lab. PhD Thesis / Thèse de PhD: Decision-making and coordination of foraging and defence in ants.

Berenice Romero, University of Saskatchewan, Prager Lab. PhD Thesis / Thèse de PhD : Host plant use in a phytoplasma vector.

Students participating in the Grad Student Showcase / vitrine de la communauté étudiante des cycles supérieurs. Left to right: Aaron Bell, Asim Reynard, Berenice Romero, Saif.Nayani.

Réunion annuelle

La Société d'entomologie de Saskatchewan et la Société d'entomologie du Canada ont accueilli la réunion annuelle conjointe de 2023 à Saskatoon, du 15 au 18 octobre 2023.

Les membres du comité des affaires étudiantes et de début de carrière ont organisé et facilité la vente aux enchères silencieuses qui a permis de récolter **1620\$** pour les bourses d'études de la SEC. Merci à tous ceux qui ont fait des dons et qui ont enchéri sur les articles. Nous remercions tout particulièrement Catherine Scott d'avoir organisé la vente aux enchères et de s'être occupée de la collecte des articles!

Le comité des affaires étudiantes et de début de carrière a organisé une autre fantastique **vitrine de la communauté étudiante des cycles supérieurs** lors de la réunion. Cette vitrine est une occasion très visible pour les membres de la SEC qui ont soutenu ou prévoient de soutenir leur thèse dans une université canadienne dans l'année qui suit la réunion, de faire des présentations de 30 minutes dans le cadre d'une conférence invitée. Toutes nos félicitations aux récipiendaires de la vitrine 2023 :



T. Wist

Getting Involved with the ESC

SEPAC is always keen to take on new members! Volunteering for SEPAC is a great way to get involved with the Society and promote entomology across Canada. If you are interested in joining or just have suggestions for new initiatives in the coming year, email us at students@esc-sec.ca, or contact us personally at rowan.french@mail.utoronto.ca and mattmuzzatti@email.carleton.ca. We look forward to hearing from you!

S'impliquer au sein de la SEC

Le comité des affaires étudiantes et de début de carrière est toujours prêt à accueillir de nouveaux membres! Le bénévolat au sein du comité des affaires étudiantes et de début de carrière est une excellente façon de s'impliquer dans la Société et de promouvoir l'entomologie à travers le Canada. Si vous souhaitez devenir membre ou si vous avez des suggestions pour de nouvelles initiatives pour l'année à venir, envoyez-nous un courriel à students@esc-sec.ca, ou contactez-nous personnellement à rowan.french@mail.utoronto.ca et mattmuzzatti@email.carleton.ca. Nous attendons vos commentaires avec impatience!

Thesis Roundup / Foisonnement de thèses

SEPAC wants to recognize and celebrate the accomplishments of newly minted entomology grads! If you or a student you know has recently defended an entomology-related thesis at a Canadian University, please send the following details to students@esc-sec.ca: student's name, date, degree, thesis title, supervisor(s), and university. This information will appear on the ESC website and in the next ESC Bulletin.

Congratulations to the following for successfully defending their thesis!

Le comité veut reconnaître et célébrer les réalisations des nouveaux diplômés en entomologie! Si vous, ou un étudiant que vous connaissez, a récemment soutenu sa thèse dans un domaine lié à l'entomologie dans une université canadienne, merci d'envoyer les informations suivantes à students@esc-sec.ca nom de l'étudiant, date, diplôme, titre de la thèse, directeur(s) et université. Cette information apparaîtra sur le site web de la SEC et dans le prochain Bulletin de la SEC.

Félicitations aux personnes suivantes qui ont défendu leur thèse avec succès!

Kayla Gaudet, Acadia University, Hillier Lab. MSc Thesis / Mémoire de MSc : Investigating chemoreception and behavioural responses of *Tetranychus urticae* Koch to naturally based repellents and acaricides.

Victoria Ivey, Acadia University, Hillier Lab. MSc Thesis / Mémoire de MSc : Molecular and neural plasticity in the pheromone response of the corn earworm moth (*Helicoverpa zea*).

Thanusha Suresh, Acadia University, Hillier Lab. MSc Thesis / Mémoire de MSc : Olfactory receptor neuron responses of eastern spruce budworm, *Choristoneura fumiferana* Clemens. (Lepidoptera: Tortricidae) to female sex pheromones and host volatiles.

Taylor Swanburg, Acadia University, Hillier Lab. MSc Thesis / Mémoire de MSc : Detecting the spread of invasive mosquitoes and disease potential in Nova Scotia.

Sandunika Mullegama, Acadia University, Hillier Lab. MSc Thesis / Mémoire de MSc :

Identification of compounds produced by male hairpencil glands of Corn Earworm *Helicoverpa zea*, and their role in male autodetection and female mate acceptance.

2023 ESC Student Awards

Tyler Wist, Chair of the ESC Student Award Committee

Thank you to the ESC students for putting forward excellent award applications in the 2023 ESC award competition. This year, the ESC Scholarship Trust awarded thirteen scholarships to deserving ESC student members.



ESC postgraduate scholarships

The ESC postgraduate scholarships assist students in study and research leading to a postgraduate degree in entomology. Our three winners this year are:



MSc level: Kendal Singleton (Simon Fraser University); No Photo

PhD level: Matthew Muzzatti (Carleton University; above right, presented by ESC President Chris MacQuarrie) and **Maria Tocora** (University of Toronto; above left



Entomological Society of Canada Graduate Research Travel Scholarships

To foster graduate education in entomology, the Entomological Society of Canada offers research-travel scholarships to help students increase the scope of the graduate training. These scholarships provide an opportunity for students to undertake research or course work pertinent to their thesis subject that could not be carried out at their own institution.

Cailyn McKay of the University of Western Ontario was presented with the **Graduate Research Travel (MSc) award** by ESC president Chris MacQuarrie.

The Keith Kevan Award

In memory of Dr. D. Keith McE. Kevan, the Entomological Society of Canada offers one postgraduate award of \$2,000 biennially to assist students in postgraduate programs who are studying systematics in entomology.

The winner this year is **Alice Assmar** of McGill University.



Dr. Lloyd M. Dosdall Scholarship

The **Dr. Lloyd M. Dosdall Memorial Scholarship** was endowed by Teresa Height-Dosdall to honour the memory of Dr. Lloyd M. Dosdall and commemorate his many contributions to crop protection, insect ecology, and aquatic entomology in Canada. These awards are for students conducting research in the area of “arthropod community ecology” with a focus on aquatic or agro-ecosystems.

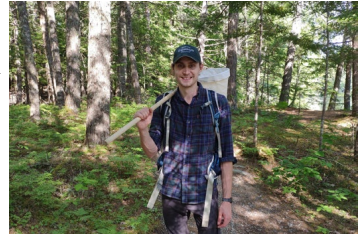
Three **Lloyd Dosdall Memorial Scholarships** were awarded: **Kelly Murray-Stoker** of the University of Toronto (left), **Catherine Woo-Durand** of McGill University (middle) and **Shayla Woodland** of the University of Manitoba (right, presented by ESC president Chris MacQuarrie).



John H. Borden Award

In honour of Dr. John H. Borden, and his contributions in the field of forest pest ecology, this award assists students who are studying Integrated Pest Management (IPM) with an entomological emphasis.

Three **John H. Borden Scholarships** were awarded: **Kendal Singleton** of Simon Fraser University (no photo), **Alexandra Dolezal** of the University of Guelph (no photo) and **Luca Voscort** of Acadia University (right).



Danks Scholarships

The **Danks scholarship** support studies on the Canadian fauna in memory of David Danks (1974-2008), reflecting the interests of David and of his father Hugh in environmental science and entomology.

Two **Danks Scholarships** were awarded: **Taylor Swanburg** of Acadia University (left) and **Catherine Woo-Durand** of McGill University (right).

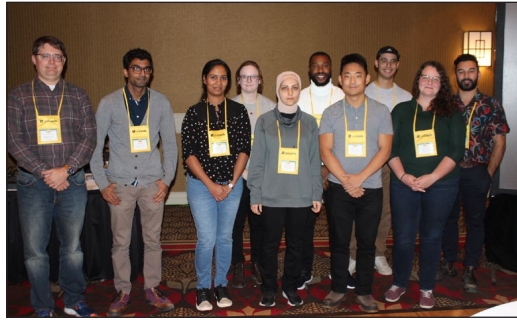


Becker awards

The committee also awarded nine Ed Becker Conference travel awards to help students attend the 2023 ESC-ESS JAM in Saskatoon, Saskatchewan. There were nine winners this year: **Priyatha Chennamkulangara** (University of Alberta), **Jose Correa Ramos** (University of Alberta), **Olajide Fatukasi** (University of Alberta), **Claire Gooding** (Simon Fraser University), **Mahsa Hakimara** (Concordia University), **Emmanuel Hung** (Simon Fraser University), **Jessica Lario** (University of Alberta), **Saif Nayani** (Simon Fraser University), and **Asim Renyard** (Simon Fraser University),

Becker Award Winners:

From left to right: Chris Macquarrie (ESC President) and winners Saif Nayani, Priyatha Chennamkulangara, Claire Gooding, Mahsa Hakimara, Olajide Fatukasi, Emmanuel Hung, Jose Correa Ramos, Jessica Lario and Asim Renyard.



I'd like to thank my committee members for their time and effort adjudicating these awards, especially the new members who have joined the ESC Student Awards Committee this year: Julie Soroka (Saskatchewan), Murray Isman (British Columbia), Ian Scott (Ontario), and Justis Henault (Manitoba). Thanks to long-serving members, Marla Schwarzfeld (Ontario), Christian Hébert (Quebec), Adam Brunke (Ontario), Joanna Konopka (United States). Thanks to our retiring members, Julia Mlynarek, Lisa Poirier for their years of service. Jen Kowalchuk of Strauss Management does an excellent job of compiling all the student award applications before handing them over to the awards committee.

I would also like to acknowledge and honour the memory of Lisa Poirier, who was a long-serving member of the ESC Student Awards committee and had just retired from serving on this committee. She will be missed by her ESC Student Award colleagues and by the ESC.

President's Prize Winners:

Poster Competition:

1. Wei Han Lau; 2. Katelyn Stokes

Oral Sessions:

Ecology & Evolution:

1. Matthew Muzzatti; 2. Thomas Hall

Taxonomy, Genetics & Diversity:

1. Elyssa Loewen; 2. Leah Jackson

Pest Management:

1. Ilan Domnich; 2. Marina Carla Bezerra da Silva

Behaviour:

1. Emmanuel Hung; 2. Claire Gooding



2024 ESC Student Awards / Bourses d'études de la SEC 2024

Tyler Wist

Chair, ESC Student Awards Committee / Président, Comité des bourses d'études de la SEC

Hello ESC students! Please submit your applications for the ESC Student Awards by March 2024 to be eligible for the awards. Please read the details on the webpage carefully (Student Awards – Entomological Society of Canada (<https://esc-sec.ca/student/student-awards/>)) and submit all applications by email to the ESC Association Coordinator at info@esc-sec.ca. Awards available this year are the Biological Survey of Canada Scholarship (\$2000), the John H. Borden Scholarship (\$1000), two Danks Scholarships (each at \$1500), two Dr Lloyd M. Dosdall Memorial Scholarships (\$1000 each), Postgraduate Scholarships (MSc and PhD, each at \$2000), and the Graduate Research Travel Scholarships. For all awards, two letters of reference are required (see website) as well as all of your official grades from undergraduate to your current level of education.

Bonjour aux étudiants de la SEC ! Veuillez soumettre vos candidatures pour les bourses d'études de la SEC avant le 1er mars 2023 afin d'être éligible. Veuillez lire attentivement les détails sur la page web (Bourses d'études -Société d'entomologie du Canada (<https://esc-sec.ca/fr/students/student-awards/>)) et soumettre toutes les demandes par courriel à la personne responsable de la coordination de l'association de la SEC à info@esc-sec.ca. Les bourses disponibles cette année sont la bourse de la Commission biologique du Canada (2000\$), la bourse John H. Borden (1000\$), deux bourses Danks (à 1500\$), deux bourses commémoratives Dr Lloyd M. Dosdall (à 1000\$), des bourses d'études supérieures (maîtrise et doctorat, chacune 2000\$) et des bourses de voyage pour la recherche. Pour toutes les bourses, deux lettres de recommandation sont requises (voir site web) ainsi que toutes vos notes officielles depuis le premier cycle jusqu'à votre niveau d'études actuel.

People in the news / Gens qui font les manchettes

Charles Vincent intronisé au Temple de la Renommée de l'agriculture du Québec.

Le 21 octobre 2023, lors d'une cérémonie publique faite à Québec (Qc, Canada), Charles Vincent été intronisé au Temple de la Renommée de l'agriculture du Québec.

Voir: <https://www.laterre.ca/actualites/distinctions/banquet-pour-des-personnalites-dexception/>

Charles Vincent inducted to the Quebec Agricultural Hall of Fame

During a public ceremony held in Quebec City (QC, Canada) on 21 October 2023, Charles Vincent was inducted to the Quebec Agricultural Hall of Fame.

Voir: <https://www.laterre.ca/actualites/distinctions/banquet-pour-des-personnalites-dexception/>

Prix à la Société d'Entomologie du Québec / Awards at the Société d'Entomologie du Québec

Guy Boivin received the "Meritorious Member" award for his 37-year distinguished career with Agriculture and AgriFood Canada, at the annual meeting of the SEQ, Société d'Entomologie du Québec, Congratulations Guy.

Congratulations to Jacques Brodeur for his award received for "Entomological Distinction".



Entomological Society of British Columbia

From 15-16th September 2023, the Entomological Society of British Columbia held its Annual General Meeting and Conference at Thompson Rivers University in Kamloops. The theme of the meeting was “Insects: The Environmental Heartbeat”. By all accounts the conference was a great success with 46 people attending, exactly half of whom were students. Each year at the conference, the ESBC awards prizes for outstanding student presentations at the undergraduate, Masters, and Doctoral levels. This year, **Charlotte Pinard** from SFU and **Jacob McPherson** from UBC claimed top prizes for their presentations in the undergraduate category. **Claire Gooding** and **Saif Nayani**, both from SFU, won the MSc award, and **Sam Maraj** from SFU won the PhD prize. **Saif Nayani** was also awarded the Dexter Johnson Award for the best peer-reviewed journal article by a student in the field of insect ecology and **Karina Torres** from UBC was awarded the Equity, Diversity, & Inclusion Award.

Finally, a new award was established this year by the Society called the “Legacy Award” to recognize BC entomologists that have made outstanding contributions to the discipline of entomology throughout their career. It recognizes individuals who have made significant contributions in research, mentoring, teaching, extension, innovation, pest management and active volunteer involvement in the ESBC and other societies/organizations in BC and beyond. The inaugural winner of this award was **Dezene Huber** from the University of Northern British Columbia.



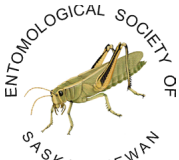
Entomological Society of Alberta

The Entomological Society of Alberta held its Annual General Meeting on 19 August 2023 in Edmonton, AB. It followed 1.5 days of great talks and posters (and an exciting power outage....). More students (n=36) than regular members (n=27) were in attendance, so the future looks bright! Topics of discussion at the AGM included: i) incorporation of hybrid meetings into the schedule; ii) meeting organization documentation; iii) student travel awards; and iv) potentially changing the official acronym (ESA) of the society, for obvious reasons! Next year's meeting will be held somewhere in southern Alberta.

A local organizing committee is in place for the JAM of the Entomological Societies of Alberta and Canada that will be held in Alberta in 2025. The committee is in discussion with municipalities and hotels to determine the location of the meeting that will be held in October 2025.

The new Entomological Society of Alberta Board and Officers are listed below

President: Boyd Mori	Southern Director Valentina Ibarra
Vice President: Carol Frost	Regional Director to ESC: Maya Evenden
Past President: James Glassier	Proceedings Editor: Heather Proctor
Treasurer: Antonia Musso	Social Media Director: Lisa McLeod
Secretary: Sharavari Kulkarni	Webmaster: Micky Ahn
Northern Director: Amanda Jorgenson	Outreach Director: Ilan Domnich
Central Director: Ken Fry	



Entomological Society of Saskatchewan

ESC-ESS JAM 2023 was an amazing success! The ESS recognizes all the work that goes into planning and execution and thanks all the local organizing committee members for their time, dedication, energy and talents! The Entomological Society of Saskatchewan local organizing committee, in turn, would like to thank all of those that volunteered their time at the conference making sure things ran smoothly. Our sponsors were generous and allowed us to incorporate many fun activities and onsite food into our conference with their donations. And most importantly we would like to thank everyone from far and wide for coming out to Saskatoon!

Our conference was attended by a high proportion of students which made us very happy! Although organizing these conferences is a lot of work we were so happy with how this went and very much appreciate being your first regional conference since COVID. It was truly a reunion for many of us and was so much fun!

Organizing committee member and graduate student Georgiana Antochi-Crihan learning hoop dancing with other participants from hoop dancer Lawrence Roy.



A. Mills



Entomological Society of Ontario

Planning an entomology outreach event in Ontario

Over the past 10 years, the Entomological Society of Ontario has focused heavily on outreach-related events supporting the province's largest entomology events such as Bug Days in Ottawa, Guelph and London, in addition to smaller one-time events. If you are planning an entomology related public outreach event in Ontario, the ESO can provide some financial support! Let us know your intent to apply by emailing entsocont.newsletter@gmail.com with the subject "Outreach application" We will then send you a 1-page application form. Because funding allocation must be decided early, application forms submitted after the deadline may not be eligible for support. **Outreach application deadline: 15 March 2024**

Follow ESO on Instagram! @ent_soc_ontario

The Entomological Society of Ontario is now on Instagram! Visit the page to learn about upcoming contests, events, and members' research! Follow, like, and share!

Interested in showcasing your work on our Instagram?

We are looking to showcase some work from entomologists in our community! If you're interested in having your work shared to our media accounts, please submit a blurb to the Communications team (Nicole Regimbal (nicole.regimbal@mail.utoronto.ca) and Alyssa Stephens (alysastephens4@gmail.com)).

Example content: A recent paper that's now available (include the title, a short blurb, and a picture); other ento-related work or events, e.g., projects in restoration, agriculture/forestry, community that highlight the work people in the society are doing (include a blurb about the project and a picture)



Acadian Entomological Society

The new vice president of the society is Dr. Sara Edwards, who is a research scientist with Natural Resources Canada. She joins the executive along with current president Joe Bowden, also of Natural Resources Canada, and past president Md Habibullah Bahar of the Pest Management Regulatory Agency.

The annual general meeting of the AES will take place in Corner Brook NL, 14-16 August 2024. This promises to be a meeting with great science, plenary speaker Dr. Maxim Larivée, and some spectacular field trips!

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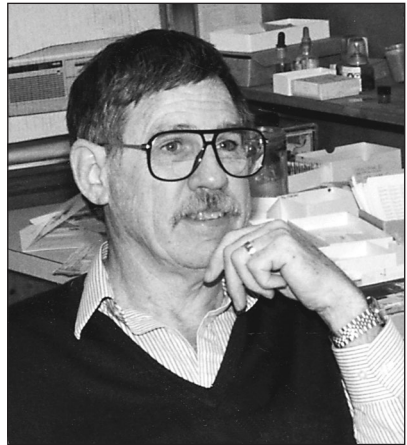
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The Scientific Contributions of John Milton Campbell Patrice Bouchard and Anthony Davies

This article is a celebration of the many scientific contributions made by John Milton Campbell (19 December 1935 – 6 August 2022) during his career. Milt made a significant impact on the taxonomy of two beetle families (Staphylinidae and Tenebrionidae) through the description of a large number of species. His skills as a collector, especially in tropical habitats, resulted in many new species being named in his honour. His friendliness and generosity will be remembered by all those who interacted with him.

Milt was born in Christian County, Kentucky, USA. He obtained his BSc degree from Western Kentucky State College in 1955 in Agriculture and Biology, and received a research assistantship from the University of Kentucky where he received a MSc degree in entomology in 1957. He was offered a teaching fellowship at the University of Illinois at Champaign-Urbana in 1959, where he received his PhD in Systematic Entomology under the supervision of Dr R.B. Selander. His thesis focused on a revision of the North and Central American *Lobopoda* (Coleoptera: Tenebrionidae: Alleculinae), using some of the data he obtained during field work in Panama in 1961 and Mexico in 1962. After receiving his PhD, he briefly taught at Eastern Kentucky State College before accepting a two-year contract as entomologist with the Asociación Nacional del Cafe, in conjunction with the University of Kentucky, to work on damage control of the coffee leaf miner (*Leucoptera coffeella*; Lepidoptera, Lyonetiidae) in Guatemala (1964–1966). This period facilitated his collections and knowledge of the Alleculinae of Central America, and the first of his three children was born there.

In August 1966, Milt was hired by the Entomology Research Institute (Canadian National Collection [CNC]) of the then Canada Department of Agriculture in Ottawa to conduct research on the beetle family Staphylinidae. He published over 60 papers on this family, including revisions of the New World Micropeplinae and Oxyporinae, the North American species of the omaliine genera *Acidota*, *Arpedium*, *Haida*, *Olophrum*, *Orochares*, *Porrhodites*, *Pseudohaida*, and the tachyporine genera *Bryoporus*, *Bryocharis*, *Coproporus*, *Ischnosoma*, *Lordithon*, *Mycetoporus*, *Sepedophilus*, *Tachinomorphus*, *Tachinus* and *Tachyporus*. As well as producing intermittent papers on the Alleculinae, in the later years at the CNC he began to study and publish on Asian genera and provided updates to his previous revisions (see Appendix 1). In 1972, he was elected Vice-President of the Canacol Foundation, which was established to support taxonomic



(probably by) Ales Smetana

Figure 1. Portrait of Milt Campbell taken in 1993, before Milt's retirement.

Patrice Bouchard (Patrice.Bouchard@agr.gc.ca) is a research scientist and Anthony Davies (Anthony.Davies@agr.gc.ca) is a technician in the Coleoptera Unit of the Canadian National Collection of Insects, Arachnids and Nematodes (Agriculture and Agri-food Canada), Ottawa / Patrice Bouchard (Patrice.Bouchard@agr.gc.ca) est un chercheur et Anthony Davies (Anthony.Davies@agr.gc.ca) est un technicien dans la section des coléoptères de la Collection nationale canadienne d'insectes, d'arachnides et de nématodes (Agriculture et Agroalimentaire Canada), Ottawa.



Figure 2. Photo of Milt coming out of a beaver house after looking for beetles.

Unknown (Made available by Judy Campbell)



Figure 3. Photo of CNC Coleoptera Unit, circa ~1990. Front row from left: Yves Bousquet, Gene McNamara, Donald Bright, back row: Singh Chahal, Anthony Davies, Go Sato, Milt Campbell, Ales Smetana, Laurent LeSage.

CNC Archives, photographer unknown

and curatorial work on the CNC. Among other entomological societies, he was on the council of the Coleopterists Society from 1973, was elected President in 1986, and was on the editorial board from 1983 to 2014.

Milt's expertise in collecting Coleoptera is well known to North American students. His early surveys concentrated on the neotropics, supporting his research on the Alleculinae: Guatemala (1964–1966, 1993), Mexico (1962, 1969, 1971), Colombia (1970), Panama (1961, 1970), Ecuador (1976) and Costa Rica (1979).

After joining the staff at CNC, he explored the fauna of Canada from sea to sea: Parc Gaspésie (QC) and Newfoundland (1972), northern Ontario (1973), Alberta and British Columbia (1971, 1988), the Queen Charlotte Islands (BC, 1983), and the British Mountains of Yukon (1984). He also took part in many of the Canadian National Park surveys, including: the St. Lawrence Islands (ON, 1975), Waterton Lakes (AB, 1976, 1979), Kouchibouguac (NB, 1977), Cape Breton Highlands (NS, 1984), and Rondeau Provincial Park (ON, 1985).

His expeditions in the USA included (from east to west): Mt. Washington (NH, 1976, 1987), the Great Smoky Mts. and lower Appalachians (1967, 1968, 1983, 1986), with many forays around Hopkinsville, KY; Pine Hills Field Station (IL, 1967), and the southwest (1973, 1974, 1976). As his interest in staphylinids developed, especially the Omaliinae, he became enamored with the mountainous regions of the Pacific northwest, starting with extremely productive expeditions with Aleš Smetana (1968, three months) from California to Alaska, and again in Alaska and Yukon (1978). He also concentrated on the Rocky Mountains and the Pacific northwest during expeditions in 1975, 1979 and 1981.

Milt retired early in 1993 to assist his parents on the family farm near Hopkinsville in Kentucky. He returned to Ottawa in 2011 to become a research associate at the Canadian National Collection of Insects, Arachnids and Nematodes, where he continued his work on the New World Alleculinae, especially the Costa Rican and West Indian fauna. Unfortunately, he was unable to continue his studies when access to the collection facilities was restricted due to the COVID-19 pandemic, during which time his activities became limited by failing health.

Altogether, Milt Campbell described 14 genera / subgenera and 162 species in the Staphylinidae, and 14 genera / subgenera and 115 species in the Alleculinae (see Appendices 1, 2). More than 200 of the new taxa established by Milt were published in *The Canadian Entomologist* or the *Memoirs of the Entomological Society of Canada* (Bouchard et al. 2018). As a testament to the esteem held for him by his fellow entomologists, 56 species and at least one genus of

insects were named in his honour across three insect orders (see Appendix 3). Milt passed away peacefully at the Perley Health Centre in Ottawa on 6 August 2022.

We thank Adam Brunke (Ottawa) for reviewing this manuscript.

Reference

Bouchard, P., Brunke, A.J., Davies, A.E., Douglas, H., Smith, A.B.T. and Manoogian, J. 2018. 150 years of new beetles (Coleoptera) described in *The Canadian Entomologist* and associated publications (1868–2017). *The Canadian Entomologist*, **150**: 685–696.

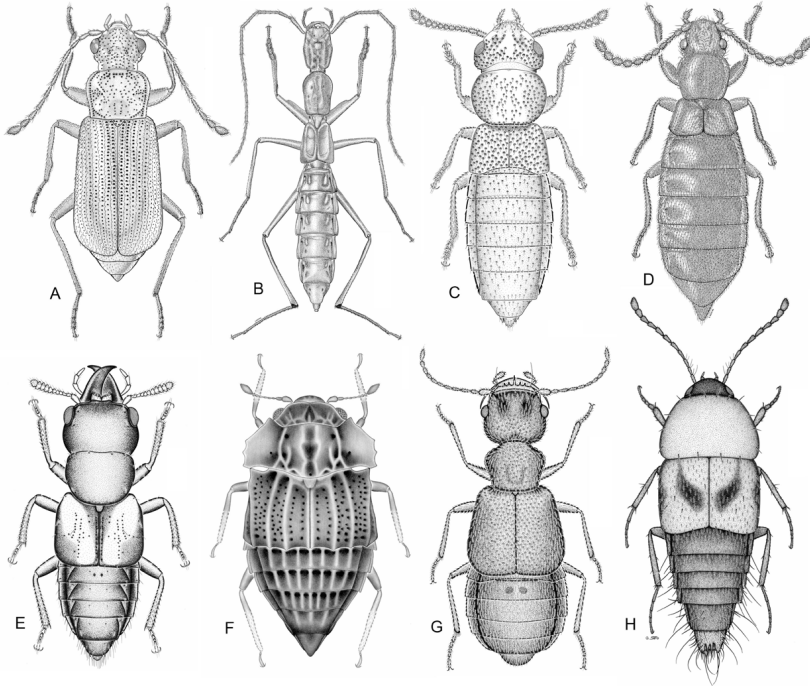


Figure 4. Genera and species of Staphylinidae described by Milton Campbell. A) *Anthobioides pubescens* Campbell, 1987 (L=3.5 mm), a new genus and species of Omaliinae with unusually elongate elytra which he and Aleš Smetana collected on Mt. Rainier and in Olympic National Park in Washington; B) *Pinostygus galapagoensis* Campbell and Peck, 1989 (L=22.0 mm), a unique blind, cave-inhabiting genus collected by Stewart Peck in the Galapagos Islands; C) *Mitosynum vockerothi* Campbell, 1982 (L=4.5 mm), an unusual new genus of flightless Oxytelinae collected during a survey by CNC staff of Kouchibouguac National Park, New Brunswick; D) *Omamorphanus aenigma* Campbell & Chandler, 1987 (L=3.3 mm), a new flightless genus and species of uncertain phylogenetic placement, which Don Chandler collected in the Cascade Range of Oregon, often on snow up to 4000 feet. E) *Oxyporus kiteleyi* Campbell, 1978 (L=8.5 mm), known only from a female specimen in his 1969 revision of this mushroom-inhabiting genus, verified to be a new species from specimens collected by Eric Kiteley in Québec; F) *Peplomicrus mexicanus* Campbell, 1979 (L=1.9mm), from forest leaf litter in Chiapas State, Mexico; G) *Gnathoryphium mandibulare* Campbell, 1978 (L=3.2 mm), a new genus and species of Omaliinae with highly elongate mandibles, which Campbell collected on Mt. Baker in Washington; H) *Tachyporus lecontei* Campbell, 1979 (L=3.0 mm), a species previously identified in museums as *T. maculipennis* LeConte, yet it is widespread in North America.

All illustrations were hand-drawn by Go Sato, the Coleoptera Unit artist at CNC from 1976 until 2015.

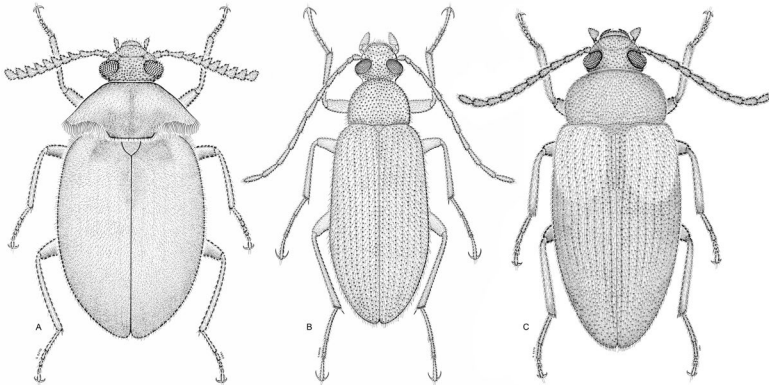


Figure 5. Genera and species described by Milton Campbell in the tenebrionid subfamily Alleculinae, the group which he studied at the beginning of his entomological career, and on which he was still publishing near the end of his life. A) *Cornucistela serrata* Campbell, 1980 (L=5.9 mm), an unusual new genus and species which he published in the *Fauna of Saudi Arabia* series; B) *Onychomira floridensis* Campbell, 1984 (L=7.5mm), a new genus and species with very long legs and tarsi from Archbold Biological Station in Florida, which he surmised might have been an introduced species, but which has yet to be identified as such; C) *Hymenorus rufohumeralis* Campbell, 1982 (L=6mm) from California, the last new species of that genus described from North America north of Mexico.

Appendix 1. List of publications by John Milton Campbell.

Scientific articles

- Rodriguez, J.G. and Campbell, J.M. 1961. Effects of gibberellin on nutrition of the mites, *Tetranychus telarius* and *Panonychus ulmi*. *Journal of Economic Entomology*, **54**: 984–987.
- Campbell, J.M. 1962. Two new species of *Hymenorus* (Coleoptera: Alleculidae) from Panama. *The Coleopterists Bulletin*, **16**: 92–96.
- Campbell, J.M. 1963. A fossil beetle of the genus *Hymenorus* (Coleoptera: Alleculidae) found in amber from Chiapas, Mexico. *University of California Publications in Entomology*, **31**: 41–42.
- Campbell, J.M. and Marshall J.D. 1964. The ocular index and its application to the taxonomy of the Alleculidae (Coleoptera). *The Coleopterists Bulletin*, **18**: 42.
- Campbell, J.M. 1965. A revision of the genus *Charisius* (Coleoptera: Alleculidae). *The Coleopterists Bulletin*, **19**: 43–56.
- Rodriguez, J.G., Campbell, J.M. and Eveleens, K.G. 1966. Effects of some oil-insecticide combinations on coffee leaf miner. *Journal of Economic Entomology*, **59**: 773–779.
- Campbell, J.M. 1966. Sexual behaviour in the genus *Androchirus* (Coleoptera: Alleculidae). *Proceedings of the Entomological Society of Washington*, **68**: 258–264.
- Campbell, J.M. 1966. A revision of the genus *Lobopoda* (Coleoptera: Alleculidae) in North America and the West Indies. *Illinois Biological Monographs*, **37**: 1–203.
- Campbell, J.M., Rodriguez, J.G. and Eveleens, K.G. 1967. Field studies of insecticides for control of the coffee leaf miner, *Leucoptera coffeella* (Lepidoptera: Lyonetiidae). *Turrialba*, **17**: 165–171.
- Campbell, J.M. 1968. A revision of the New World Micropeplinae (Coleoptera: Staphylinidae) with a rearrangement of the world species. *The Canadian Entomologist*, **100**: 225–267.
- Campbell, J.M. 1968. A revision of the Mexican and Central American species of *Isomira* (Coleoptera: Alleculidae). *The Canadian Entomologist*, **100**: 449–469.
- Campbell, J.M. 1969. A revision of the New World Oxyporinae (Coleoptera: Staphylinidae). *The Canadian Entomologist*, **101**: 225–268.

- Campbell, J.M. 1971. A revision of the Alleculidae (Coleoptera) of the West Indies. *Memoirs of the Entomological Society of Canada*, **81**: 1–140.
- Campbell, J.M. 1973. A revision of the genus *Tachinus* (Coleoptera: Staphylinidae) of North and Central America. *Memoirs of the Entomological Society of Canada*, **90**: 1–137.
- Campbell, J.M. 1973. New species and records of New World Micropeplinae (Coleoptera: Staphylinidae). *The Canadian Entomologist*, **105**: 569–576.
- Campbell, J.M. 1973. A revision of the genus *Tachinomorphus* (Coleoptera: Staphylinidae) of North and Central America. *The Canadian Entomologist*, **105**: 1015–1034.
- Campbell, J.M. 1973. A new ecitophilous species of *Ecitoxenia* Wasmann (Coleoptera, Staphylinidae) from Colombia. *Papéis Avulsos de Zoologia (São Paulo)*, **27**: 27–30, 1 pl.
- Campbell, J.M. 1973. New species and records of neotropical termitophilous Staphylinidae. I. Subtribe Timeparthenina. *Papéis Avulsos de Zoologia (São Paulo)*, **27**: 83–94.
- Howden, H.F., and J.M. Campbell. 1974. Observations on some Scarabaeoidea in the Colombian Sierra Nevada de Santa Marta. *The Coleopterists Bulletin*, **28**: 109–114.
- Campbell, J.M. 1974. A new species of *Micropeplus* (Coleoptera: Micropeplidae) from Oregon. *The Canadian Entomologist*, **106**: 465–466.
- Ullrich, W.G., and J.M. Campbell. 1974. A revision of the *apterus* group of the genus *Tachinus* Gravenhorst (Coleoptera: Staphylinidae). *The Canadian Entomologist*, **106**: 627–644.
- Campbell, J.M. 1974. A new species of *Oxyporus* (Coleoptera: Staphylinidae) from Mexico with comments on *Oxyporus elegans* LeConte. *The Coleopterists Bulletin*, **28**: 155–157.
- Campbell, J.M. 1974. Lectotype designation for *Tachinomorphus grandis* (Solsky) (Coleoptera: Staphylinidae). *The Coleopterists Bulletin*, **28**: 158.
- Campbell, J.M. 1975. New species and records of *Tachinus* (Coleoptera: Staphylinidae) from North America. *The Canadian Entomologist*, **107**: 87–94.
- Campbell, J.M. 1975. A revision of the genera *Coproporus* and *Cilea* (Coleoptera: Staphylinidae) of America north of Mexico. *The Canadian Entomologist*, **107**: 175–216.
- Campbell, J.M. 1975. A revision of the Alleculidae (Coleoptera) of Chile. *Revista Chilena de Entomología*, **9**: 13–39.
- Campbell, J.M. 1975. Lectotype designation of *Conosoma carinula* Blatchley (= *Coproporus laevis* LeConte) (Coleoptera: Staphylinidae). *The Coleopterists Bulletin*, **29**: 204.
- Campbell, J.M. 1976. A review of the tachyporine genus *Euconosoma* Cameron (Coleoptera: Staphylinidae) with a description of a new species from Nepal. *The Coleopterists Bulletin*, **30**: 139–145.
- Campbell, J.M. 1976. New records of Mexican *Tachinus* (Coleoptera: Staphylinidae). *The Coleopterists Bulletin*, **30**: 193–197.
- Campbell, J.M. 1976. A revision of the genus *Sepedophilus* Gistel (Coleoptera: Staphylinidae) of America North of Mexico. *Memoirs of the Entomological Society of Canada*, **No. 99**: 1–89.
- Campbell, J.M. 1976. Redescription of *Tachyporus stejnegeri* Blackwelder, a Palearctic and not a Nearctic species. *Entomologica Scandinavica*, **7**: 235–236.
- Campbell, J.M. 1977. Removal of *Mycetochara puncticollis* (Blatchley) from the Alleculidae to the Melandryidae (Coleoptera). *The Coleopterists Bulletin*, **31**: 328.
- Campbell, J.M. 1978. New species and records of West Indian Alleculidae (Coleoptera). *Studies on Neotropical Fauna and Environment*, **13**: 203–212.
- Campbell, J.M. 1978. *Hymenochara*, a new genus of Alleculidae (Coleoptera) based on *Mycetochara rufipes* and a new species from Arizona. *The Canadian Entomologist*, **110**: 435–441.
- Campbell, J.M. 1978. A revision of the North American Omaliinae (Coleoptera: Staphylinidae). 1. The genera *Haida* Keen, *Pseudohaida* Hatch, and *Eudectoides* new genus. *Memoirs of the Entomological Society of Canada*, **No. 106**: 1–19.
- Campbell, J.M. 1978. A revision of the North American Omaliinae (Coleoptera: Staphylinidae). 2. The tribe Coryphiini. *Memoirs of the Entomological Society of Canada*, **No. 106**: 20–87.
- Campbell, J.M. 1978. New species of *Oxyporus* (Coleoptera: Staphylinidae) from North America. *The Canadian Entomologist*, **110**: 805–813.
- Campbell, J.M. 1978. A review of the North American species of *Mycetochara* Berthold (Coleoptera: Alleculidae). *The Canadian Entomologist*, **110**: 921–948.
- Campbell, J.M. 1979. New species and records of New World Micropeplidae (Coleoptera). II. *The Canadian Entomologist*, **110** [1978]: 1247–1258.

- Campbell, J.M. 1979. A revision of the genus *Tachyporus* Gravenhorst (Coleoptera: Staphylinidae) of North and Central America. *Memoirs of the Entomological Society of Canada*, **No. 109**: 1–95.
- Campbell, J.M. 1979. *Coprophilus castoris*, a new species of Staphylinidae (Coleoptera) from beaver lodges in eastern Canada. *The Coleopterists Bulletin*, **33**: 223–228.
- Campbell, J.M. 1980. Insects of Saudi Arabia. Coleoptera: Fam. Alleculidae. *Fauna of Saudi Arabia* **2**: 133–136.
- Campbell, J.M. 1980. A revision of the genus *Carphacis* des Gozis (Coleoptera: Staphylinidae) of North America. *The Canadian Entomologist*, **112**: 935–953.
- Smetana, A., and J.M. Campbell. 1980. A new genus and two new phloeocharine species from the Pacific coast of North America (Coleoptera: Staphylinidae). *The Canadian Entomologist*, **112**: 1061–1069.
- Campbell, J.M. 1980. Distribution patterns of Coleoptera in eastern Canada. *The Canadian Entomologist*, **112**: 1161–1175.
- Campbell, J.M. 1982. A new species of *Hymenorus* (Coleoptera: Alleculidae) from California. *The Coleopterists Bulletin*, **36**: 131–134.
- Campbell, J.M. 1982. A revision of the genus *Lordithon* Thomson of North and Central America (Coleoptera: Staphylinidae). *Memoirs of the Entomological Society of Canada*, **No. 119**: 5–114.
- Campbell, J.M. 1982. A revision of the North American Omaliinae (Coleoptera: Staphylinidae). 3. The genus *Acidota* Stephens. *The Canadian Entomologist*, **114**: 1003–1029.
- Campbell, J.M. 1982. *Mitosynum vockerothi*, a new genus and new species of Coleoptera (Staphylinidae: Oxytelinae) from eastern Canada. *The Canadian Entomologist*, **114**: 687–691.
- Campbell, J.M. 1983. A new species of *Pycnoglypta* Thomson (Coleoptera: Staphylinidae) from eastern Canada. *The Canadian Entomologist*, **115**: 361–370.
- Campbell, J.M. 1983. A revision of the North American Omaliinae (Coleoptera: Staphylinidae). The genus *Olophrum* Erichson. *The Canadian Entomologist*, **115**: 577–622.
- Campbell, J.M. and Tomlin, A.D. 1983. The first record of the Palearctic species *Anotylus insecatus* (Gravenhorst) (Coleoptera: Staphylinidae) from North America. *The Coleopterists Bulletin*, **37**: 309–313.
- Campbell, J.M. 1984. A revision of the North American Omaliinae (Coleoptera: Staphylinidae) the genera *Arpedium* Erichson and *Eucnecosum* Reitter. *The Canadian Entomologist*, **116**: 487–527.
- Campbell, J.M. 1984. A review of the North American species of the omaliine genera *Porrhodites* Kraatz and *Orochares* Kraatz (Coleoptera: Staphylinidae). *The Canadian Entomologist*, **116**: 1227–1249.
- Campbell, J.M. 1984. *Onychomira floridensis*, a new genus and species from Florida with a revised key to the genera of North American Alleculidae (Coleoptera). *The Coleopterists Bulletin*, **38**: 288–300.
- Campbell, J.M. 1986. A review of the new world species of *Peplomicrus* Berhauer (Coleoptera: Micropeplidae) with description of a new species from Peru. *The Coleopterists Bulletin*, **40**: 62–74.
- Campbell, J.M. 1986. *Lobopoda socia* (LeConte), newly established in Florida (Coleoptera: Alleculidae). *The Coleopterists Bulletin*, **40**: 154–156.
- Campbell, J.M. and Chandler, D.S. 1987. *Omalorphanus aenigma*, an unusual new genus and species of Omaliinae (Coleoptera: Staphylinidae) from Oregon. *The Canadian Entomologist*, **119**: 315–327.
- Campbell, J.M. 1987. *Anthobioides pubescens*, an unusual new genus and species of Omaliinae (Coleoptera: Staphylinidae) from Washington. *The Canadian Entomologist*, **119**: 1027–1042.
- Campbell, J.M. 1987. A new species of *Euconosoma* Cameron (Coleoptera: Staphylinidae) from Thailand. *The Coleopterists Bulletin*, **41**: 233–236.
- Campbell, J.M. 1988. New species and records of North American *Tachinus* Gravenhorst (Coleoptera: Staphylinidae). *The Canadian Entomologist*, **120**: 231–295.
- Campbell, J.M. 1989. *Micropeplus nelsoni*, a new species from the Cascade Range of Washington (Coleoptera: Micropeplidae). *The Coleopterists Bulletin*, **43**: 305–310.
- Campbell, J.M. and Peck, S.B. 1989. *Pinostygyus galapagoensis*, a new genus and species of eyeless rove beetle (Coleoptera: Staphylinidae: Paederinae) from a cave in the Galapagos Islands, Ecuador. *The Coleopterists Bulletin*, **43**: 397–405.
- Campbell, J.M. 1990. A new species of *Oxyporus* (Coleoptera: Staphylinidae) and rediscovery of *O. flohri* from Guatemala. *The Coleopterists Bulletin*, **44**: 211–215.
- Campbell, J.M. and Peck, S.B. 1990. *Omalonomus relictus*, an unusual new genus and new species (Coleoptera: Staphylinidae, Omaliinae) of blind rove beetle; a preglacial (Tertiary?) relict in the Cypress Hills, Alberta-Saskatchewan, Canada. *The Canadian Entomologist*, **122**: 949–961.

- Campbell, J.M. 1991. *Peplomicrus iviei* new species; first report of the family Micropeplidae from the West Indies. The Coleopterists Bulletin, **45**: 37–41.
- Campbell, J.M. and Génier, F. 1991. Redescription of *Oxyporus (Oxyporus) bierigi* Campbell from Costa Rica (Coleoptera: Staphylinidae). The Coleopterists Bulletin, **45**: 81–85.
- Campbell, J.M. 1991. *Tachyporus melanopterus*, a new name for *Tachyporus nigripennis* Campbell (Coleoptera: Staphylinidae: Tachyporinae). The Coleopterists Bulletin, **45**: 378.
- Campbell, J.M. 1991. A revision of the genera *Mycetoporus* Mannerheim and *Ischnosoma* Stephens (Coleoptera: Staphylinidae: Tachyporinae) of North and Central America. Memoirs of the Entomological Society of Canada, **No. 156**: 1–169.
- Campbell, J.M. 1992. Case 2733. *Mycetoporus* Mannerheim, 1831 (Insecta, Coleoptera): proposed designation of *Tachinus punctus* Gravenhorst, 1806 as the type species; proposed conservation of *Ischnosoma* Stephens, 1829; and proposed precedence of *Mycetoporus* over *Ischnosoma*. Bulletin of Zoological Nomenclature, **49**: 35–40.
- Campbell, J.M. 1992. A review of the family Micropeplidae (Coleoptera) of Taiwan. Bulletin of the National Museum of Natural Science (Taichung), **3**: 209–224.
- Campbell, J.M. 1993. A review of the species of *Nitidotachinus* New Genus (Coleoptera: Staphylinidae: Tachyporinae). The Canadian Entomologist, **125**: 521–548.
- Campbell, J.M. 1993. A revision of the genera *Bryoporus* Kraatz and *Bryophacis* Reitter and two new related genera from America north of Mexico (Coleoptera: Staphylinidae: Tachyporinae). Memoirs of the Entomological Society of Canada, **No. 166**: 1–85.
- Campbell, J.M. 1993. A review of the species *Tachinus* Gravenhorst (Coleoptera: Staphylinidae: Tachyporinae) of Taiwan. Bulletin of the National Museum of Natural Science (Taichung), **4**: 33–46.
- Campbell, J.M. 1993. A review of the genus *Olophrinus* Fauvel (Coleoptera: Staphylinidae: Tachyporinae) with descriptions of four new species. Bulletin of the National Museum of Natural Science (Taichung), **4**: 47–70.
- Campbell, J.M. and Winchester, N. 1993. First record of *Pseudohaida rothi* Hatch (Coleoptera: Staphylinidae: Omaliinae) from Canada. Journal of the Entomological Society of British Columbia, **90**: 83.
- Campbell, J.M. 1994. *Cileoporus*, a new genus of rove beetle from Central and South America (Coleoptera: Staphylinidae: Tachyporinae). Studies on Neotropical Fauna and Environment, **29**: 125–144.
- Campbell, J.M. 1994. The first record of *Micropeplus smetanai* Campbell from northern Ontario, Canada with remarks on an unusual modification of the head and tibia (Coleoptera: Micropeplidae). The Coleopterists Bulletin, **48**: 293–298.
- Campbell, J.M. 1994. A revision of the genus *Coprotachinus* Cameron (Coleoptera: Staphylinidae: Tachyporinae). Bulletin de l'Institut Royal des Sciences Naturelles de Belgique Entomologie, **64**: 25–47.
- Campbell, J.M. 1995. New species and records of Micropeplidae (Coleoptera) from Taiwan. Bulletin of the National Museum of Natural Science (Taichung), **5**: 117–130.
- Campbell, J.M. 1995. New species and new synonymy in the genus *Nitidotachinus* Campbell (Coleoptera: Staphylinidae). Koleopterologische Rundschau, **65**: 43–46.
- Campbell, J.M. 2014. New species and records of *Charisius* Champion from Mexico and Central America (Coleoptera, Tenebrionidae, Alleculinae). ZooKeys, **415**: 269–293.
- Campbell, J.M. 2014. An unusual suite of sexual characters in three new species of *Hymenorus* (Coleoptera, Tenebrionidae, Alleculinae) from Guatemala and Mexico. ZooKeys, **415**: 295–309.
- Bousquet, Y., Bouchard, P. and Campbell, J.M. 2015. Catalogue of genus-group names in Alleculinae (Coleoptera: Tenebrionidae). The Coleopterists Society Monograph Series, **69**: 131–151.
- Mullen, L.J., Campbell, J.M. and Sikes, D.S. 2018. Taxonomic revision of the rove beetle genus *Phlaeopterus* Motschulsky, 1853 (Coleoptera: Staphylinidae: Omaliinae: Anthophagini). The Coleopterists Society Monographs, Patricia Vaurie Series, **No. 16**: 1–54.

Book chapters

- Campbell, J.M., Ball, G.E., Becker, E.C., Bright, D.E., Helava, J., Howden, H.F., Parry, R.H., Peck, S.B. and Smetana, A. 1979. 40. Coleoptera. In: Danks, H.V. (Ed.) Canada and its Insect Fauna. Memoirs of the Entomological Society of Canada, **No. 108**: 357–387.
- Campbell, J.M. 1984. Family Micropeplidae. In: Catalogue of the Coleoptera of North America north of Mexico. United States Department of Agriculture, Agriculture Handbook No. 529-24, 1-4.

Campbell, B.A. and Campbell, J.M. 1985. Beetle. In: The Canadian Encyclopedia, Vol. 1, A-For. Hartig Publishers, Edmonton, 158.

Campbell J.M. 1991. In Bousquet, Y. (Editor). Checklist of beetles of Canada and Alaska. Families Cupedidae [p. 6], Micromalthidae [p. 6], Ptiliidae [pp. 75–76], Limulodidae [pp. 76], Agyrtidae [p. 77], Micropeplidae [p. 84], Silphidae [pp. 84–86], Staphylinidae [Campbell and A. Davies; pp. 86–124], Scaphidiidae [pp. 124–125], Eucinetidae [p. 141], Clambidae [pp. 141–142], Scirtidae [p. 142], Dascillidae [p. 143], Rhipiceridae [p. 143], Nosodendridae [p. 196], Lymexylidae [p. 206], Sphindidae [p. 213], Languriidae [pp. 223–224], Erotylidae [pp. 225–226], Phalacridae [p. 226], Cerylonidae [p. 227], Corylophidae [p. 228], Endomychidae [pp. 237–239], Biphylidae [p. 241], Byturidae [pp. 241–242], Rhipiphoridae [pp. 250–251], Zopheridae [p. 252], Tenebrionidae [Bousquet, Y. and Campbell; pp. 253–261], Lagriidae [pp. 261–262], Cephaloidea [pp. 262–263], Meloidae [pp. 263–266], Oedemeridae [p. 266], Prostomidae [p. 267], Mycteridae [p. 267], Boridae [p. 268], Pythidae [p. 268], Pyrochroidae [p. 269], Salpingidae [p. 270]. Agriculture Canada Publication 1861/E, 430 pp., Ottawa.

Books

Campbell, J.M., Sarazin, M.J. and Lyons, D.B. 1989. Canadian beetles (Coleoptera) injurious to crops, ornamentals, stored products, and buildings. Agriculture Canada, Research Branch Publication 1826, Ottawa, Canada, i–iv + 491 pp.

Other publications

Lafontaine, J.D., Allyson, S., Behan-Pelletier, V.M., Borkent, A., Campbell, J.M., Hamilton, K.G.A., Martin, J.E.H., and Masner, L. 1987. The Insects, Spiders and Mites of Cape Breton Highlands National Park. Agriculture Canada, BRC Report / Rapport CRB 1, 302 pp.

Appendix 2. New taxa described by John Milton Campbell.

Species-group names

STAPHYLINIDAE

Anthobioides pubescens Campbell, 1987
Bolitopunctus punctatissimus Campbell, 1993
Bryophacis arcticus Campbell, 1993
Bryophacis canadensis Campbell, 1993
Bryophacis smetanai Campbell, 1993
Bryoporus niger Campbell, 1993
Coprophilus castoris Campbell, 1979
Coproporus obscurior Campbell, 1975
Coproporus piceorufus Campbell, 1975
Coprotachinus cameroni Campbell, 1994
Coryphium nigrum Campbell, 1978
Dytoscotes pacificus Smetana and Campbell, 1980
Excitoxenia lucanoides Campbell, 1973
Euconosoma loebli Campbell, 1987
Euconosoma nepalensis Campbell, 1976
Gnathoryphium mandibulare Campbell, 1978
Haida bisulcata Campbell, 1978
Haida insulcata Campbell, 1978
Ischnosoma arizonense Campbell, 1991
Ischnosoma ashei Campbell, 1991
Ischnosoma costale Campbell, 1991
Ischnosoma durangoense Campbell, 1991
Ischnosoma fimbriatum Campbell, 1991
Ischnosoma hermani Campbell, 1991
Ischnosoma lecontei Campbell, 1991
Ischnosoma mexicanum Campbell, 1991

Ischnosoma pecki Campbell, 1991
Ischnosoma suteri Campbell, 1991
Lordithon (Bobitobus) fungicola Campbell, 1982
Lordithon (Bobitobus) notabilis Campbell, 1982
Lordithon (Bobitobus) oregonus Campbell, 1982
Lordithon (Lordithon) antennatus Campbell, 1982
Lordithon (Lordithon) appalachianus Campbell, 1982
Lordithon (Lordithon) ashei Campbell, 1982
Lordithon (Lordithon) blandus Campbell, 1982
Lordithon (Lordithon) consors Campbell, 1982
Lordithon (Lordithon) difficilis Campbell, 1982
Lordithon (Lordithon) dubius Campbell, 1982
Lordithon (Lordithon) hidalgoensis Campbell, 1982
Lordithon (Lordithon) howdeni Campbell, 1982
Lordithon (Lordithon) newtoni Campbell, 1982
Lordithon (Lordithon) nubicola Campbell, 1982
Lordithon (Lordithon) oreophilus Campbell, 1982
Lordithon (Lordithon) scutellaris Campbell, 1982
Micropeplus browni Campbell, 1968
Micropeplus chypeatus Campbell, 1992
Micropeplus durangoensis Campbell, 1968
Micropeplus lecontei Campbell, 1968
Micropeplus minor Campbell, 1974
Micropeplus nelsoni Campbell, 1989
Micropeplus neotomae Campbell, 1968

- Micropeplus newtoni* Campbell, 1979
Micropeplus nitidipennis Campbell, 1995
Micropeplus obscurus Campbell, 1992
Micropeplus robustus Campbell, 1968
Micropeplus sinuatus Campbell, 1992
Micropeplus smetanai Campbell, 1973
Micropeplus spinatus Campbell, 1992
Micropeplus taiwanensis Campbell, 1992
Micropeplus volcanus Campbell, 1973
Micropeplus yushanensis Campbell, 1995
Mycosynum vockerothi Campbell, 1982
Mycetoporus bipunctatus Campbell, 1991
Mycetoporus floridensis Campbell, 1991
Mycetoporus impunctatus Campbell, 1991
Mycetoporus neomexicanus Campbell, 1991
Mycetoporus nidicola Campbell, 1991
Mycetoporus pacificus Campbell, 1991
Mycetoporus rufohumeralis Campbell, 1991
Mycetoporus segregatus Campbell, 1991
Mycetoporus smetanai Campbell, 1991
Mycetoporus triangulatus Campbell, 1991
Nitidotachinus horni Campbell, 1973
Nitidotachinus javanus Campbell, 1995
Olophrinus loebli Campbell, 1993
Olophrinus nepalensis Campbell, 1993
Olophrinus philippinus Campbell, 1993
Olophrum cascadenense Campbell, 1983
Olophrum idahoense Campbell, 1983
Omalonomus relictus Campbell and Peck, 1990
Omalorphanus aenigma Campbell and Chandler, 1987
Orochares suteri Campbell, 1984
Oxyporus (Oxyporus) ashei Campbell, 1978
Oxyporus (Oxyporus) balli Campbell, 1969
Oxyporus (Oxyporus) bierigi Campbell, 1969
Oxyporus (Oxyporus) kiteleyi Campbell, 1978
Oxyporus (Oxyporus) lawrencei Campbell, 1974
Oxyporus (Oxyporus) minasensis Campbell, 1990
Oxyporus (Oxyporus) neomexicanus Campbell, 1978
Peplomicrus dybasi Campbell, 1968
Peplomicrus iviei Campbell, 1991
Peplomicrus mexicanus Campbell, 1979
Peplomicrus pecki Campbell, 1979
Peplomicrus watrousi Campbell, 1986
Phlaeopterus bakerensis Mullen and Campbell, 2018
Phlaeopterus elongatus Mullen and Campbell, 2018
Phlaeopterus hatchi Mullen and Campbell, 2018
Phlaeopterus kavanaughi Mullen and Campbell, 2018
Phlaeopterus obsoletus Mullen and Campbell, 2018
Phlaeopterus occidentalis Mullen and Campbell, 2018
Phlaeopterus olympicus Mullen and Campbell, 2018
Phlaeopterus smetanai Mullen and Campbell, 2018
Phloeocharis (Phloeocharis) californica Smetana and Campbell, 1980
Pinostygus galapagoensis Campbell and Peck, 1989
Pycnoglypta aptera Campbell, 1983
Sepedophilus arizonensis Campbell, 1976
Sepedophilus beckeri Campbell, 1976
Sepedophilus brachypterus Campbell, 1976
Sepedophilus coronadensis Campbell, 1976
Sepedophilus ctenidialis Campbell, 1976
Sepedophilus frosti Campbell, 1976
Sepedophilus hermani Campbell, 1976
Sepedophilus kiteleyi Campbell, 1976
Sepedophilus micans Campbell, 1976
Sepedophilus smetanai Campbell, 1976
Sepedophilus stephani Campbell, 1976
Sepedophilus velox Campbell, 1976
Sepedophilus wickhami Campbell, 1976
Subhaida aptera Campbell, 1978
Subhaida californica Campbell, 1978
Subhaida monticola Campbell, 1978
Subhaida sinuata Campbell, 1978
Subhaida utahensis Campbell, 1978
Tachinomorphus arizonensis Campbell, 1973
Tachinomorphus sharpi Campbell, 1973
Tachinus beckeri Campbell, 1988
Tachinus californicus Campbell, 1988
Tachinus glacialis Ullrich and Campbell, 1974
Tachinus horni Campbell, 1973
Tachinus jacuticus ullrichi Campbell, 1988
Tachinus mexicanus Campbell, 1973
Tachinus minimus Campbell, 1973
Tachinus minor Campbell, 1975
Tachinus nearcticus Campbell, 1973
Tachinus oaxacensis Campbell, 1973
Tachinus schuhi Campbell, 1975
Tachinus smetanai Campbell, 1973
Tachinus stacesmithi Campbell, 1973
Tachinus (Tachinoderus) taichungensis Campbell, 1993
Tachinus vergatus Campbell, 1973
Tachinus (Tachinoderus) yushanensis Campbell, 1993
Tachyporus (Palporus) neomexicanus Campbell, 1979
Tachyporus (Tachyporus) blomae Campbell, 1979
Tachyporus (Tachyporus) borealis Campbell, 1979
Tachyporus (Tachyporus) browni Campbell, 1979
Tachyporus (Tachyporus) canadensis Campbell, 1979
Tachyporus (Tachyporus) dimorphus Campbell, 1979
Tachyporus (Tachyporus) fenyesi Campbell, 1979
Tachyporus (Tachyporus) flavipennis Campbell, 1979

Tachyporus (Tachyporus) howdenorum Campbell, 1979
Tachyporus (Tachyporus) inornatus Campbell, 1979
Tachyporus (Tachyporus) lecontei Campbell, 1979
Tachyporus (Tachyporus) melanopterus Campbell, 1991 [nom. nov.]
Tachyporus (Tachyporus) nigripennis Campbell, 1979
Tachyporus (Tachyporus) nimbicola Campbell, 1979
Tachyporus (Tachyporus) ornatus Campbell, 1979
Tachyporus (Tachyporus) pacificus Campbell, 1979
Tachyporus (Tachyporus) rulomoides Campbell, 1979
Tachyporus (Tachyporus) sharpi Campbell, 1979
Tachyporus (Tachyporus) stacesmithi Campbell, 1979
Timeparthenus seeversi Campbell, 1973
Timeparthenus silvestrii Campbell, 1973

TENEBRIONIDAE

Allecula caribea Campbell, 1971
Allecula chilensis Campbell, 1975
Allecula coquimbensis Campbell, 1975
Allecula fragilicornis Campbell, 1975
Allecula penai Campbell, 1975
Allecula ramosi Campbell, 1971
Allecula semiobscura Campbell, 1975
Charisius apterus Campbell, 2014
Charisius granulatus Campbell, 2014
Charisius howdenorum Campbell, 2014
Charisius mexicanus Campbell, 1965
Charisius punctatus Campbell, 2014
Cornucistela serrata Campbell, 1980
Hymenochara arizonensis Campbell, 1978
Hymenorus anguillae Campbell, 1971
Hymenorus antillensis Campbell, 1971
Hymenorus bahamensis Campbell, 1971
Hymenorus balli Campbell, 2014
Hymenorus bifurcatus Campbell, 2014
Hymenorus chiapasensis Campbell, 1963 [fossil]
Hymenorus chiriquensis Campbell, 1962
Hymenorus cubensis Campbell, 1971
Hymenorus darlingtoni Campbell, 1971
Hymenorus excavatus Campbell, 2014
Hymenorus farri Campbell, 1971
Hymenorus haitellus Campbell, 1971
Hymenorus haitius Campbell, 1971
Hymenorus hispaniolensis Campbell, 1971
Hymenorus insularis Campbell, 1971
Hymenorus jamaicensis Campbell, 1971
Hymenorus minutus Campbell, 1971
Hymenorus panamensis Campbell, 1962
Hymenorus pygmaeus Campbell, 1971
Hymenorus rufohumeralis Campbell, 1982

Hymenorus sparsepunctatus Campbell, 1971
Hymenorus transversus Campbell, 1971
Hymenorus wolcottii Campbell, 1971
Isomira acuta Campbell, 1968
Isomira alticola Campbell, 1968
Isomira championi Campbell, 1968
Isomira howdeni hidalgoensis Campbell, 1968
Isomira howdeni howdeni Campbell, 1968
Isomira mexicana Campbell, 1968
Isomira rotundata Campbell, 1968
Isomira subaenea guatemalensis Campbell, 1968
Isomira subaenea punctata Campbell, 1968
Isomira subaenea soror Campbell, 1968
Latacula beckeri Campbell, 1971
Latacula insularis Campbell, 1971
Lobopoda (Flavipoda) androsi Campbell, 1971
Lobopoda (Flavipoda) bahamensis Campbell, 1966
Lobopoda (Flavipoda) badius Campbell, 1971
Lobopoda (Flavipoda) bicolor Campbell, 1966
Lobopoda (Flavipoda) cayamasensis Campbell, 1966
Lobopoda (Flavipoda) emarginata Campbell, 1966
Lobopoda (Flavipoda) flavifemoralis Campbell, 1966
Lobopoda (Flavipoda) nesiotica Campbell, 1971
Lobopoda (Flavipoda) quadratinota Campbell, 1971
Lobopoda (Flavipoda) schwarzi Campbell, 1971
Lobopoda (Flavipoda) tibiodentata Campbell, 1966
Lobopoda (Flavipoda) villasensis Campbell, 1971
Lobopoda (Glabilobopoda) coronadensis Campbell, 1966
Lobopoda (Glabilobopoda) darlingtoni Campbell, 1971
Lobopoda (Glabilobopoda) impunctata Campbell, 1966
Lobopoda (Glabilobopoda) portobellensis Campbell, 1966
Lobopoda (Glabilobopoda) tilaranensis Campbell, 1966
Lobopoda (Lobopoda) acuticauda Campbell, 1966
Lobopoda (Lobopoda) alutacea Campbell, 1971
Lobopoda (Lobopoda) brunneipennis Campbell, 1966
Lobopoda (Lobopoda) championi Campbell, 1966
Lobopoda (Lobopoda) colona Campbell, 1971
Lobopoda (Lobopoda) cordata Campbell, 1971
Lobopoda (Lobopoda) costaricensis Campbell, 1966
Lobopoda (Lobopoda) cubensis Campbell, 1966
Lobopoda (Lobopoda) distans Campbell, 1971
Lobopoda (Lobopoda) diversicauda Campbell, 1966
Lobopoda (Lobopoda) fallaciosa Campbell, 1971
Lobopoda (Lobopoda) granulata Campbell, 1966
Lobopoda (Lobopoda) guatemalensis Campbell, 1966

Lobopoda (Lobopoda) guerrerensis Campbell, 1966
Lobopoda (Lobopoda) haitensis Campbell, 1966
Lobopoda (Lobopoda) hispaniolensis Campbell, 1971
Lobopoda (Lobopoda) jamaicensis Campbell, 1966
Lobopoda (Lobopoda) meridensis Campbell, 1966
Lobopoda (Lobopoda) micans Campbell, 1971
Lobopoda (Lobopoda) monticola Campbell, 1966
Lobopoda (Lobopoda) nigrissima Campbell, 1966
Lobopoda (Lobopoda) notapuncta Campbell, 1971
Lobopoda (Lobopoda) paracollis Campbell, 1971
Lobopoda (Lobopoda) paracornis Campbell, 1971
Lobopoda (Lobopoda) picipennis Campbell, 1971
Lobopoda (Lobopoda) polita Campbell, 1971
Lobopoda (Lobopoda) remoinsularis Campbell, 1966
Lobopoda (Lobopoda) sandersoni Campbell, 1971
Lobopoda (Lobopoda) substriatus Campbell, 1966
Lobopoda (Lobopoda) tabogensis Campbell, 1966
Lobopoda (Lobopoda) terminalis Campbell, 1966
Lobopoda (Lobopoda) thomasensis Campbell, 1971
Lobopoda (Lobopoda) veracruzensis Campbell, 1966
Lobopoda (Lobopoda) wittmeri Campbell, 1978
Lobopoda (Mesolobopoda) antiguaensis Campbell, 1971
Lobopoda (Mesolobopoda) trinidadensis Campbell, 1966
Lycula chilensis Campbell, 1975
Mycetochara marshalli Campbell, 1978
Narsodes brachypterus Campbell, 1975
Narsodes brunneus Campbell, 1975
Notacula howdenae Campbell, 1971
Obesacula aptera Campbell, 1971
Onychomira floridensis Campbell, 1984
Parahymenorus metallicus caymanensis Campbell, 1971
Parahymenorus metallicus metallicus Campbell, 1971

Phediodes apterus Campbell, 1975
Phediodes pubescens Campbell, 1975
Pseudocistela sandersoni Campbell, 1971
Punctacula howdeni Campbell, 1971

Genus-group names

STAPHYLINIDAE

Anthobioides Campbell, 1987
Bolitopunctus Campbell, 1993
Cileoporus Campbell, 1994
Dytoscotes Smetana and Campbell, 1980
Eudectooides Campbell, 1978
Gnathoryphium Campbell, 1978
Holoboreaphilus Campbell, 1978
Mitosynum Campbell, 1982
Neobolitobius Campbell, 1993
Nitidotachinus Campbell, 1993
Omalonomus Campbell and Peck, 1990
Omalorphanus Campbell and Chandler, 1987
Pinostygus Campbell and Peck, 1989
Tachyporus (Palporus) Campbell, 1979

TENEBRIONIDAE

Cornucistela Campbell, 1980
Hymenochara Campbell, 1978
Latacula Campbell, 1971
Lobopoda (Flavipoda) Campbell, 1966
Lobopoda (Glabrilobopoda) Campbell, 1966
Lobopoda (Mesolobopoda) Campbell, 1966
Lycula Campbell, 1975
Narsodes Campbell, 1975
Notacula Campbell, 1971
Obesacula Campbell, 1971
Onychomira Campbell, 1984
Parahymenorus Campbell, 1971
Phediodes Campbell, 1975
Punctacula Campbell, 1971

Appendix 3. Taxa described by others to honour John Milton Campbell.

Species-group names

COLEOPTERA

CANTHARIDAE

Malthinus campbelli Wittmer, 1980
Paramaronius campbelli Brancucci, 1984
Tytthonyx (Thinalmus) campbelli Wittmer, 1991

CARABIDAE

Anillinus campbelli Giachino, 2011
Asklepia campbellorum Zamorano and Erwin, 2014
Nebria campbelli Kavanaugh, 1984

Oxytrechus campbelli Mateu, 1991

Paratrechus campbelli Mateu, 1999

Pterostichus (Pseudoferonina) campbelli Bousquet, 1985

CHRYSOMELIDAE

Meibomeus campbelli Kingsolver and Whitehead, 1976

CLERIDAE

Enoclerus campbelli Opitz, 2021

Priocera campbelli Opitz, 2021

COCCINELLIDAE

Carinodula campbelli Gordon, Pakaluk and Ślipiński, 1989

CURCULIONIDAE

Pandeleteius (Pandeleteius) campbelli A.T. Howden, 1976

Theognete campbelli Anderson, 2010

HISTERIDAE

Operclipygus campbelli Caterino and Tishechkin, 2013

HYBOSORIDAE

Callosides campbelli H.F. Howden, 1971

HYDRAENIDAE

Hydraena campbelli Perkins, 1980

HYDROPHILIDAE

Cymbiodyta campbelli Smetana, 1974

LEIODIDAE

Anisotoma campbelli Wheeler, 1979

Leiodes campbelli Baranowski, 1993

MURMIDIIDAE

Murmidius campbelli Jalozyński and Ślipiński, 2022

SCARABAEIDAE

Callosides campbelli H. Howden, 1971

Cryptocanthon campbellorum H. Howden, 1973

Euparixia campbelli Gordon and McCleve, 2003

STAPHYLINIDAE

Barrojuba campbelli Chandler, 1988

Boreostiba campbelliana Lohse, 1990

Dimetrota campbelli Lohse, 1990 [now in *Atheta*]

Giulianium campbelli Moore, 1976

Gymnusa campbelli Klimaszewski, 1979

Gyrophynus campbelli Smetana, 1982

Heterothops campbelli Smetana, 1971

Holotrochus campbelli Irmeler, 1987

Ischnosoma campbelli Kocian, 1997

Lordithon campbelli Schülke, 2000

Megalopinus campbelli Puthz, 2012

Neolindus campbelli Herman, 1991

Parosus campbelli Makranczy, 2014

Pseudopsis campbelli Zerche, 1992

Pycnoglypta campbelli Gusarov, 1995

Quedius (Microsaurus) campbelli Smetana, 1971

Quedius (Microsaurus) miltoni Brunke, 2020

Schistoglossa (Schistoglossa) campbelli

Klimaszewski, 2009

Schistoglossa (Schistoglossa) pseudocampbelli

Klimaszewski and Webster, 2009

Sepedophilus campbelli Herman, 2001

Stenaesthetus campbelli Orousset, 1990

Stenus (Stenus) campbelli Puthz, 1973

Stenus campbellorum Puthz, 1988

Tachinus (Tachinus) campbelli Ullrich, 1975

Tachinus (Tachinoderus) miltoni Schülke, 2003

Tannea campbellii Irmeler, 2005

TENEBRIONIDAE

Anamphidora campbelli Marshall, 1967

Hymenorus campbelli Bouchard, 2018

Oracula campbelli Nabozhenko and Perkovsky, 2023

DIPTERA

Druciatus campbelli Marshall, 1995

HYMENOPTERA

Aoridus campbelli Yoshimoto, 1971

Gonatopus campbelli Olmi, 1984

Spiniteleia campbelli Masner, 1980

Genus-group names

COLEOPTERA

STAPHYLINIDAE

Campbellia Kistner & Jacobson, 1990



Geoffrey G.E. Scudder: Zoologist, Conservationist, and Educator

Rob Cannings, Syd Cannings, Karen Needham, and John Spence

Professor Geoffrey George Edgar Scudder B.Sc., D.Phil., FESC, FRES, FRSC, OC, a giant of Canadian entomology, passed away in Vancouver, British Columbia on 4 July 2023, after several years of poor health. Geoff had distinguished himself through exemplary service in science that had unusual influence from local classrooms to the world stage. We were fortunate to know him as a friend, colleague, and mentor and offer this tribute in celebration of his life and accomplishments.

Geoff Scudder was born on 18 March 1934 at Fawkham, Kent, UK. At the age of 12 he knew he wanted to be an entomologist and began pursuing that dream. In his high school years at a boys' grammar school in Gravesend, Geoff was greatly influenced by his gifted biology teacher, R.D. Ellis and, with the encouragement of an amateur hemipterist, H.K. Airy Shaw, he began studying Heteroptera (Scudder 2008).

In 1955, Geoff graduated with First Class Honours from the University of Wales, Aberystwyth, which he attended because Mr. Ellis had studied there, leaving Geoff with a highly positive impression of the school. Three years later, in 1958, at the age of 24, he received his doctorate in entomology from Oxford University on the basis of a ground-breaking dissertation about the comparative morphology and evolution of insect female terminalia. As he told the story, the only change he was required to make before acceptance of the thesis was to substitute the word "terminalia" for "genitalia" in the title "...because it was thought the term "genitalia" might be unacceptable to the higher authorities at the university." (Scudder 2008). Geoff and Jacqueline Howard were also married that same year and moved to Vancouver, where Geoff had accepted a faculty position in the Zoology Department at the University of British Columbia (UBC). Daughter Nicola Claire was born in Vancouver in 1965. They made their home in Vancouver, where Geoff spent his entire post-graduate university career, from 1958 to 1999, at UBC and served as Professor Emeritus until his death. He was made an Assistant Professor in 1960, promoted to the rank of Professor in 1968, and served as Head of the Zoology Department from 1976 to 1991 (Figure 1). Geoff was highly regarded at UBC and remains the only UBC faculty member ever to receive all four of the highest honours the university bestows—the Master Teacher Award (1976), the Killam Research Prize (1989), the President's Service Award for Excellence (1993), and the UBC Alumni Faculty Citation Award (1997).



Figure 1. Professor Geoffrey G.E. Scudder, circa 1991.

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In his brief scientific autobiography (Scudder 2008), Geoff modestly described himself as belonging to the “group of biologists that includes field or museum naturalists who enjoy working outdoors and who often collect a favourite group of organisms and study systematics, ecology, behaviour, and the like.” He was indeed such a scientist but was much more. How does one begin to describe the phenomenon that was Geoff Scudder? Superb zoologist. Intellectual whirlwind, prodigious writer, forceful speaker. Enthusiastic and supportive teacher and mentor. Relentless researcher, tireless insect collector, curious naturalist. Efficient administrator and organizer. Dedicated conservationist, lobbyist for biological causes and servant of science. A dynamic but unassuming, kind and private man. In short, Geoff Scudder was a highly accomplished academic and scientist known and deeply respected across Canada and around the world.

As is true for many energetic personalities, retirement hardly changed Geoff’s life. For example, he published about as many peer-reviewed papers in 2001 (7), two years after retirement, as he did in 1977 (8), in the middle of his career. However, he never would have considered counts of published papers as a proper gauge of his contribution—his work resulted from his desire to learn and to transmit knowledge about the world he loved. Despite periodic bouts of serious ill-health over the years, Geoff continued to astound all who knew him with his energy and “I’ll do that” attitude. His work ethic was legendary. Some of us who served at his side on the Biological Survey of Canada recall more than once finding him working late at night after a day-long Ottawa meeting or a long flight East, identifying bugs in the Canadian National Collection of Insects, only to discover the next morning that he had returned to his hotel room to write grant proposals or manuscripts from 3 to 6 AM. That might not be a recommended practice, but that was Geoff in action! That’s one way he got all that work done.

At UBC, fresh from his doctoral studies at Oxford, Geoff replaced Professor George Spencer, the famous, long-serving zoology and entomology professor who had retired two years before. The charismatic Spencer was a hard act to follow, but Geoff, although more reserved than his predecessor, succeeded brilliantly. He established the Spencer Memorial Lecture to honour Spencer, over the years inviting dozens of international luminaries to UBC to speak on insect biology—for example, the first to lecture was the legendary insect physiologist, Sir Vincent Wigglesworth. In 2001, after his own retirement, this lecture series was succeeded by the Geoffrey G.E. Scudder Lecture in Entomology, a tribute by his students and colleagues to his influence. Like Spencer, Scudder loved the open rangeland of the Dry Interior of British Columbia and, although he energetically travelled the whole province studying its insects, early in his UBC career he made the Cariboo–Chilcotin region the focus of his field studies.

Researcher and Writer

Geoff Scudder published 248 peer-reviewed papers, 6 books, 12 book chapters, and more than 100 other articles, mostly on entomological subjects. A summary of his work, including references to selected papers, is given here to illustrate the breadth of his interests and the accomplishments of his research.

Scudder’s early interest in Hemiptera resulted in publications during his university studies. His first refereed paper was co-authored by his boyhood friend and early colleague in Hemiptera systematics, the well-known British ecologist Sir Richard Southwood. Its subject was the life histories of two British lace bugs (*Tingis*) on thistles (Southwood and Scudder 1956). Years later, Geoff briefly returned to the Tingidae (Scudder 2012), this time in the Canadian fauna. Other early papers on faunistics and taxonomy (Scudder 1956a) also resulted from his undergraduate studies in Wales.

While at Oxford, his first of dozens of papers on the seed bugs (Lygaeidae) appeared, many concerning foreign faunas (Scudder 1956b, 1957a). For decades, Scudder was a world authority on these insects, concentrating on the Subfamily Rhyparochrominae (now considered a separate

family) from around the world (Scudder 1957c, 1962, 1971e, 1984, 2016, 2019). Overall, in the seed bug fauna, he described two families and about 70 genera and 280 species. He studied lygaeids in most world regions—especially in North America, Africa, Asia, and Oceania—and participated on expeditions and research projects in Kenya, Tanzania, Indonesia, Malaysia, Singapore, Hong Kong, Australia, and Papua New Guinea. He visited most of the major world biological museums and spent extended periods working in the Natural History Museum (London), the Russian Academy of Sciences (St. Petersburg), the Canadian National Collection of Insects (Ottawa) (Figure 2), and the Bernice P. Bishop Museum (Honolulu). He was a Research Associate of the Bishop Museum and the Royal British Columbia Museum.



Figure 2. Geoff Scudder at Canadian National Collection of Insects, Ottawa, Ontario, May 1960.

Spencer Entomological Collection, Beaty Biodiversity Museum, UBC.

Of course, Hemiptera of all sorts fascinated Geoff throughout his career; in addition to his international systematic studies, he made impressive contributions to the understanding of the systematics and diversity of the Canadian fauna (Scudder 1963, 1971b, 1987, 1991, 1993a, 1997b, 2010a; Maw et al. 2000; Scudder and Schwartz 2001; Scudder and Footitt 2006; Scudder et al. 2010; Larson and Scudder 2018; Footitt et al. 2019). He was the Canadian expert on the Suborder Prosorrhyncha (=Heteroptera) and produced systematic syntheses treating the Pentatomoidea, Lygaeoidea, Miridae, and aquatic and semiaquatic Heteroptera of Canada. The last paper in Geoff's long and fruitful publishing career was a short note solving a taxonomic problem in the hemipteran family Oxycarenidae (Scudder 2021).

Despite all his work with the Hemiptera during his student years, Scudder's doctoral research was his ground-breaking and original investigation of the insect ovipositor. In this work he stressed the importance of the abdominal structure of the Lepismatidae (Order Thysanura) in the interpretation of female genitalia (Scudder 1957b, 1957d, 1961a, 1961b). Also, in an important early paper (Scudder 1959), flowing from his dissertation at Oxford, he described the heteropteran female genitalia and its role in classification. His 1971 paper in the *Annual Review of Entomology* (Scudder 1971a) is perceptive summary of what was then understood about the comparative morphology of insect genitalia.

Scudder's interest in morphology was not restricted to taxonomic questions concerning the Hemiptera or to comparative studies on insect genitalia. Publications ranged from evolution of the thoracic ears in Lepidoptera (Yack et al. 1999) to the evolution of the secondary palate in vertebrates (Shah et al. 1990). His teaching background in morphology and developmental biology was broad, too, and many UBC undergraduates probably recall the enthusiasm with which he drilled the comparative morphology of the vertebrate cranial nerves, aortic arches, and other critical evidence of evolution into their brains. He investigated the structure and development of insect flight muscles to clarify the biology and ecological roles of populations of aquatic Hemiptera (Corixidae, Notonectidae, Gerridae) that display various reductions of wings and musculature and a corresponding variability in their ability to disperse by flying (Acton and Scudder 1969; Scudder 1971d, 1972, 1975; Scudder and Meredith 1972). He studied the structure and function of Malpighian tubules in water boatmen (Corixidae) to explain the distribution of various species of these bugs in saline lakes and ponds (Jarial and Scudder 1970).

These last examples are part of the research that Scudder and his many students from the 1960s to the 1980s undertook in the saline lakes on the grasslands of the Cariboo-Chilcotin and Thompson regions of British Columbia (Figure 3). These projects were eclectic and varied, but most centred on the adaptations of aquatic insects to saline environments. For example, many studies, both physiological and ecological, were undertaken on the osmoregulation of corixids to account for their distribution among the varying salinities of



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Figure 3. Geoff Scudder at a field camp, Westwick Lake, Cariboo region, BC, May 1970.

the lakes. Insect survival in saline environments is related to the permeability of the integument (Oloffs and Scudder 1966; Cannings et al. 1988), the ability to modify the uptake of ions from the water, and the ability to osmoregulate the composition of the urine (Scudder 1976b). Scudder worked extensively on osmoregulation in corixids (Scudder 1971c; Scudder et al. 1972), finding, among other critical results, that apparently there is neurosecretory involvement in osmotic and ionic balance (Jarial and Scudder 1971).

All sorts of other ecological and evolutionary research on the aquatic insects of these saline habitats occurred during this fruitful period. Studies of faunistics and diversity (Scudder 1969, 1971b; Cannings and Scudder 1978), taxonomy and life-histories (Scudder 1966; Jansson and Scudder 1974; Cannings and Scudder 1979; Rowe and Scudder 1990), community structure (Spence and Scudder 1980; Lancaster and Scudder 1987), competition (Scudder et al. 1972; Bennett and Scudder 1998), feeding and predation (Jamieson and Scudder 1977; Reynolds and Scudder 1987), behaviour (Spence et al. 1980a) and physiology (Scudder 1971c; Spence et al. 1980b)—especially on the Corixidae, Gerridae, and Chironomidae—occupied the talents of Scudder and many students and colleagues.

Another strong branch of study in the 1970s and 1980s was the morphological and physiological research linking Scudder's interests in the lygaeid bugs and the evolutionary significance of warning coloration. This work focused on species of brightly coloured, red and black Lygaeinae such as *Oncopeltus fasciatus* (Dallas) and emphasized the defensive role of the cardiac glycoside heart poisons that these bugs sequester from milkweed plants. Scudder and his students showed how these insects are adapted to living on these poisonous plants (Scudder and Duffey 1972; Isman et al. 1977), how they isolate and sequester the cardenolide chemicals (Scudder and Meredith 1982), and how they use them in their defence against predators (Moore and Scudder 1985; Scudder et al. 1986).

Geoff's writings ranged widely in other areas. His interests in biogeography and faunistics resulted in many papers on insect groups other than Hemiptera (Vickery and Scudder 1987; Klimaszewski et al. 2012), especially in BC (e.g., Scudder 1976a; Scudder and Cannings 2009; Pohl et al. 2015; Ratzlaff et al. 2017). In his retirement he led a major effort to document the morphology, biology, and diversity of the insect families of British Columbia. His synthetic treatments of various faunas and biogeographic themes are well known, especially his significant contributions (Scudder 1979a) to *Canada and Its Insect Fauna* (Danks 1979) and his tireless work with insect surveys and publications concerning the Yukon fauna (Scudder 1997a, 1997b) where his interests in Beringian relationships and relict northern grasslands are showcased.

He was active in documenting the biogeography of Haida Gwaii (formerly Queen Charlotte Islands) (Scudder and Gessler 1989) and in promoting the work of the Ecological Monitoring and Assessment Network (EMAN) of Environment Canada. For this organization, he coordinated and wrote several assessments of species diversity in Canadian Ecozones (Scudder 1998; Scudder and Smith 1998). Geoff's fascination with the history of biology is exemplified by his authorship of papers on past entomological studies in British Columbia (Cannings et al. 2001; Cannings and Scudder 2001).

The examples above illustrate that Geoff was broad-minded in his approach to research on insects, and furthermore, was not averse to tackling investigations of other organisms. From the taxonomy of copepods (Sandercock and Scudder 1996) to the distribution of BC leeches (Scudder and Mann 1969), from keys to the myriapod families of Canada (Kevan and Scudder 1989) to the documentation of shrew species new to Canada (caught in his insect pitfall traps in the Okanagan) (Nagorsen et al. 2001), he was strikingly eclectic in his work.

The bigger picture was Geoff Scudder's domain, too. Evolutionary and systematic theory always played a large part in his thought. He studied industrial melanism in moths in the Vancouver area (Scudder 1972) and his interest in managing species at risk drew him to study the adaptive significance of marginal populations of species (Scudder 1989). He wrote on systematic theory (Scudder 1973), species concepts, and speciation (Scudder 1974, 1979b). But at the core of these and his many other studies was a curiosity about the organisms with which we share the world and how they live (e.g., Scudder 2017).

Collector and Museum Man

Scudder collected widely across Canada and the world, and few places accessible by road in British Columbia escaped his attention. He constantly looked to expand his understanding of insect taxonomy and the status and distribution of species. This knowledge was the foundation of his passion for biological collections and his awareness of their value to science. He was a giant in the Canadian science museum community. His work centred on the Spencer Entomological Museum at UBC (now the Spencer Entomological Collection, Beaty Biodiversity Museum), where he was Director from 1958 to 1999. During the time of his directorship, the collection more than doubled in size through his collecting efforts, those of his students and curators, and from the donations that he organized. Containing over 600,000 specimens, it is an important collection for both international research on western Canadian insects (especially Hemiptera), for student training, and for public education and extension in the local community. However, the collection would not exist today without Geoff's dedication and strong advocacy. Based on his respect for and deep commitment to the value of biological collections, he thwarted several attempts to eliminate the collection in response to budget cuts.

In addition, Geoff's expert identifications, specimen donations, and curation have improved other collections across Canada and the world. His support of the Royal BC Museum, for example, was significant. He was an RBCM Research Associate since 2001 and published numerous scientific papers with museum entomologists but, more importantly, his curatorial and collections work was invaluable (Figure 4). Geoff identified more than half of the 8000 specimens of Hemiptera in the Museum's collection, many of which he donated himself. He also collected



Figure 4. Geoff Scudder and Rob Cannings, Royal BC Museum, Victoria, BC, 2017.

C. Copley

almost 32,000 accessioned specimens of many arthropod groups and many more of his specimens await cataloguing. Extensive collections from his biodiversity surveys in Okanagan grasslands and Cariboo-Chilcotin saline lakes are deposited in the RBCM collection; they provide important baseline data for ongoing studies of environmental and faunistic change.

At the end of Geoff Scudder's career, his friends and colleagues nominated him for the Bruce Naylor Award for exceptional contributions to museum-based natural history in Canada. When he was presented the award in 2020, the citation stated: "He has made a brilliant mark on academic life in our nation. But it is the tripartite work of a natural history museum curator and administrator that lies at the heart of his career—field study, collections development, and curation; research to expand understanding of the organisms collected and classified; and interpretation, the passing of the knowledge gained to the scientific community and the public."

Since 1985, Karen Needham worked closely with Scudder, first as a volunteer in the Spencer Collection, later as his graduate student, and finally as collection curator. She notes that "During that time, I considered him a role model and a mentor; he treated me as a colleague from day one, never making me feel less than equal because of my age or gender. Always willing to listen, answer any question, and share his vast wealth of knowledge, he exemplified the true meaning of collegiality and professionalism. After more than 35 years, not a week went by when I didn't seek his guidance and expertise on some collections matter, big or small, which he provided with generosity and grace. Until well into his 80s, Dr. Scudder continued to come into the collection weekly, dropping off specimens, picking up others, and letting us know of recent taxonomic advances. I learned something about the collection's history and about entomology in general every time I spoke with him. I am honored and humbled to be a part of his legacy, which extends globally throughout the entomological community and will have a lasting effect long after he laid down his forceps."

While in the field, sitting with him at some campsite table lit by a Coleman lantern or in a cramped camper or motel room, often well after midnight, Rob and Syd Cannings were always impressed with Geoff's ability to perfectly point large numbers of the smallest bugs at amazing speed. SGC recalls that he really learned how to collect insects when Geoff sent him to the Yukon in 1979 at the beginning of the Yukon Insect Survey. Geoff visited him in mid-July, looked at his Schmitt box, and said: "Is that all you've got?" With Geoff, you learned the value of volume collecting!

Like all good field biologists, Geoff recognized at a glance those species he studied and could tell you all about their lives and evolutionary relationships. His memory of past activities was impressive, too—he could recall the details of the most obscure captures years afterwards. Fieldwork with Geoff was not without humour. Rob Cannings recalls one hot afternoon when they were stopped by road construction on the Thompson River stretch of the Trans-Canada Highway. The long line of waiting cars seemed unending. Not to miss a collecting opportunity, Geoff strolled (maybe also crawled!) along the roadside wielding his sweep net and sucking on his aspirator, much to the amusement, amazement, or consternation of the watching public. Rob also remembers collecting with him on Pelee Island in Lake Erie, the southernmost point in Canada (Figure 5). Geoff had always wanted to go there because, in addition



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Figure 5. Geoff Scudder collecting aquatic Hemiptera at Scudder, Pelee Island, Ontario, June 1985.

to its interesting fauna, collecting near Scudder, the island's sole village, would allow him to indicate on his specimen labels that the insects were collected at Scudder by Scudder. Perhaps he also collected some of the local *Scudderia* katydid that day!

Conservationist

With increasing recognition of species at risk, conservation of biological diversity became a significant theme in Geoff's research. Especially after the late 1980s, he helped document the rare and potentially threatened species and habitats of British Columbia. He stressed the importance of new arthropod surveys by developing lists of target species and priorities for inventory (Scudder 1994, 1996a) and encouraged useful inventories by publishing efficient methodologies (Winchester and Scudder 1993). Using his own extensive grassland surveys (Figure 6), he studied the effects of fire and grazing on biodiversity in grasslands. This work led to a focus on conservation of the endangered Antelope-brush (*Purshia tridentata* (Pursh) DC) community and the many species of rare insects in the South Okanagan (Scudder 1980, 1993b, 2000a). Through this research he developed a detailed understanding of issues in conservation biology and the scientific credibility to push for conservation measures on both the provincial and national political stages. He published extensively on endangered species, habitat protection, and associated legislation in Canada (Scudder 1996a, 1996b, 1999, 2000a, 2000b, 2000c, 2002, 2010b; Schindler and Scudder 1999).

Geoff's deep fascination with biological diversity, his scientific commitment to exploring it, and his work in rich and special habitats threatened by human activity inevitably led him into the Canadian conservation movement. His impact on national policies was significant. As chair of the Biodiversity Science Board of Canada (1998–2000), and as a member of the Biodiversity Convention Forum (1992–2005) and the Steering Committee of the Biodiversity Knowledge and Innovation Network for Canada (2000–2005), his work was significant in developing a sound strategy for biodiversity science and conservation for Canada. He was active in the development of the Canadian Biodiversity Strategy and the Federal Species at Risk Act.

At home in British Columbia, in particular, his influence was central to protection of species and habitats on many levels. He supplied basic scientific information relevant to conservation decisions and advised many public conservation groups and governments on technical matters. Most importantly, he was an enthusiastic, outspoken, and tireless public educator—writing and speaking in strong support of conservation initiatives. Although rooted in the academic establishment, he applied his knowledge to fight hard for conservation goals in the halls of power. He was as much at home at convincing politicians and bureaucrats to change policies as he was urging students and naturalists into useful action based on their work.

Geoff worked hard to save Garry Oak habitat on the Gulf Islands and the special grassland environments of the southern Okanagan Valley, where he established a second home. He was a founding member of the Osoyoos Desert Society and was deeply involved in habitat restoration research and public education at the Society's Osoyoos Desert Centre. As an active member of



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Figure 6. Geoff Scudder in the grasslands at Kilpoola Lake near Osoyoos, BC, May 2006.

the Science Committee of the South Okanagan-Similkameen Conservation Program, he studied ecosystem renewal, conservation area design, and how landscape configurations could promote conservation of biodiversity in the southern Interior (e.g., Warman et al. 2004). He sat on the zoological expert advisory committee for the Nature Conservancy's Ecoregional Planning for the Okanagan, which undertakes conservation planning in the Okanagan Valley in both British Columbia and Washington State. In addition, as a member of the BC Invertebrate Recovery Team, he helped develop recovery strategies for threatened species in all regions of the province.

For many years, Geoff served as a Director of The Nature Trust of British Columbia, one of the most active and influential provincial organizations supporting biodiversity projects and raising money and buying land for nature conservation. To honour his work in helping preserve

the Okanagan Valley's natural environments, the Nature Trust established the Dr. Geoff Scudder South Okanagan Grasslands Research Field Station at Vaseux Lake in 2006 (Figure 7). Heavily involved in databasing and georeferencing collections of BC insects and other groups, Geoff mapped species richness and rarity hotspots in the province in order to direct biodiversity conservation priorities to where they were most urgently needed. He also worked with the Conservation Lands Forum, which developed a biodiversity conservation strategy for the province.



Figure 7. Geoff Scudder and Carl MacNaughton (Nature Trust of BC) at opening of the Dr. Geoff Scudder South Okanagan Grasslands Research Field Station at Vaseux Lake, BC, May 2006.

Teacher and Educator

During his long tenure at UBC, Geoff was considered one of the most effective teachers in the Faculty of Science. In 1975 he won the Master Teacher Certificate of Merit and, in 1976, the Master Teacher Award. He was a stimulating lecturer; his classes, especially those of his popular course on evolution, often were filled to over-capacity by the added presence of unregistered students eager to hear the master speak. In that course, his lectures were spiced with all sorts of personal experiences, from his observations on the olive groves of Kos where Hippocrates once strolled, to his visits to Down House where Darwin thought, experimented, and wrote. To keen students, at both undergraduate and graduate levels, Geoff inspired deep interest and enthusiasm for the topics of his lectures, spurring students to seek deeper understanding of the issues that he raised. Many students, in addition to learning the information, became thoughtful evolutionary biologists as a result. Student discussions and debates frequently raged after Geoff's lectures and, clearly, he approved.

During his doctoral studies with Geoff, John Spence recalls having many thoughtful discussions about education. "When I first arrived at UBC, we discussed the courses that I should take. Geoff encouraged me to study a broad range of topics to meet my formal course requirements. I was at first reluctant but he gave two reasons that convinced me: 1) one never knows where the next breakthroughs are going to come and how progress in these areas might affect techniques that could be applied in one's own field; and 2) he claimed that when he wrote

letters of recommendation for PhD students, he wanted to be able to firmly state that they were “zoologists”, in fact, he said, “biologist” would be even better. Thus, I took some botany courses and after I’d completed the required coursework, audited a good number of other courses and seminars. In the end, I understood that having had this very broad exposure to subject matter and to the people who taught these courses was a genuine strength. The result served me very well during my own career.”

Geoff encouraged students to develop an evolutionary perspective. For him it was important to understand not only how things worked, but to have some idea why they worked in particular ways, and not in others that might have seemed more effective at first blush. John Spence remembers interesting discussions surrounding a visit to UBC by the British evolutionist, A.J. Cain. “Cain, a highly regarded evolutionist, argued that natural selection was such a powerful force that it could make animals “perfect”. However, Geoff was quick to point out that this “perfection” depended both on the circumstances prevailing in a lineage pressured to adapt, and on the opportunities made possible in the surrounding environment, and that these two things together limited the perfection possible. It was a wonderful thing to watch Geoff introduce these themes of pressures and opportunities into explanations of the evolution of vertebrates in his comparative anatomy course. I was lucky to serve as a lab demonstrator in that course for three years. It had been my least-favourite biology course as an undergraduate, but Geoff’s ability to weave facts about animal structure into stories about environmental pressures and lineage potentials turned comparative anatomy into one of my favourite topics. Being able to do this, to my mind, is the earmark of an excellent teacher.”

Geoff had his own distinctive approach to evaluation of student performance. Examinations in both the Comparative Anatomy and Evolution courses gave students an opportunity to engage in evolutionary thinking through focused, written argument. Geoff had developed an interesting way of setting and marking exams and most graduate assistants enjoyed and learned much from helping with the marking. Spence recalls “amazing discussions on how to draw the best out of students that were critical to shaping my own approach to teaching and exams. For him, it was about the discovery of how a student could use the material, rather than about recollection of specific facts.” Geoff genuinely enjoyed teaching and, as a result, we suggest, was darn good at it.

Spence notes, “Eventually, when faced with the responsibility for teaching undergraduates myself, I realized that Geoff simply employed the same excellent advice about scientific writing that he’d given me early in my doctoral program. He maintained that the facts and details by themselves were just not enough, but that one had to do the mental work to link them into a plausible story. This was the challenge that he threw out to his students at all levels. Presentations needed to have a storyline. Stories did not need to include all the known facts, but they could not be at odds with any of them. It was good discipline. Such encouragement, I am sure, helped many of us navigate the twisty road between being technically competent and becoming capable scientific thinkers. As with many things, Geoff had an uncanny way of putting his finger on the heart of the matter.”

During his UBC years, Scudder supervised 28 master’s students, 10 doctoral students, and 7 postdoctoral fellows. Students were always in charge of their own projects; Geoff’s direction was never intrusive, never exploitive, for he strongly believed that the credit for a student’s work should remain with the student. Geoff’s name was included on only those student papers that he had truly co-authored by providing more than editorial input. His belief in the value of independence for his students was crucial to their success. Geoff insisted that his students take initiative and be comfortably self-directed; however, he was always there to help and advise if wanted or needed. Although often extremely busy with administrative matters, Geoff never failed to respond to student requests for meetings, even though some of these meetings

began after most others had already gone home for the day. Many of his graduate students have continued his legacy as university professors and administrators, government research scientists and conservation biologists, museum curators, medical doctors, and teachers. He has been a mentor to many—helping, supporting, and collaborating with, his former students long after their graduation. Perhaps, most importantly, through his personal example, Geoff inspired many to become better than they likely would have been on their own.

Murray Isman is one of those former graduate students. He later became a well-known entomologist, Professor, and Dean in the Faculty of Land and Food Systems at UBC. He reminisces: “Anyone who ever worked with Geoff during his time as Head of the Department of Zoology would remember the long table behind his desk, literally covered by stacks of files and loose papers. But if you ever needed something or had a query, he would know exactly which pile to go to, and he would then rifle through the papers until he found the relevant document. It turned out to be a practice that I unknowingly emulated some 35 years later as Dean!”

Influential Scientist and Administrator

Although he loved, and was dedicated to, his research and teaching, Geoff took all aspects of university life seriously. Exhausting administrative work absorbed a huge amount of his time. His independence and fairness were appreciated by the faculty and staff of the Zoology Department during his 15 years as Head (1976–1991). He was a workhorse for the University as a whole, serving on the Senate from 1978 to 1993; during most of these years he was chair of the Senate Budget Committee, a most challenging job, especially through the difficult years of fiscal retrenchment from 1981 to 1987. He was a member of the Biology Program executive from 1976 to 1991 and, for most of that time, was its chair. From 1969 to 1991 he served on the Faculty of Science Curriculum Committee, a challenging task with results important to undergraduates. The list of other committees he sat on, or chaired, is astonishing—from innumerable advisory committees on the appointment of deans and department heads to those on libraries, buildings, collective bargaining, grievances, grants, and other topics. In short, he was a valued part of the mechanics that made UBC work with ample respect for the academic tradition and in ways compatible with education in the sciences.

Geoff Scudder’s long and distinguished record of service in science, from the local schoolroom to the world stage, has inspired many. He was always a staunch supporter and promoter of entomological societies. He served as president of both the Entomological Society of BC (1966–1967) and of the Entomological Society of Canada (1986–1987). From 1976 until well after retirement, he was either an executive member or committee member of the Entomological Society of Canada and, in 1975, was awarded the Society’s Gold Medal for Outstanding Contribution to Entomology. In 1977, he was elected a Fellow of the Society. He was made an Honorary Life Member of the Entomological Society of BC in 1998. Geoff was a founder and major player in the Biological Survey of Canada (Terrestrial Arthropods) (BSC), serving on (and frequently chairing) its Scientific Advisory Committee. He contributed enormously to the BSC’s scientific work, notably its publications and the ambitious insect surveys of the Yukon Territory and the grasslands of Canada.

His influence nationally was also exemplified by his service as President of the Canadian Society of Zoologists (1989–1990), his membership on advisory committees to Agriculture and Agri-food Canada, the Canadian Space Agency, Canadian Museum of Nature, Environment Canada, and many other agencies. As a member of various granting committees of the Natural Sciences and Engineering Research Council of Canada (NSERC) in the 1980s and 1990s, Geoff helped dispense resources for biological research in Canada. In addition, as part of the National Research Council of Canada’s Monograph Editorial Board (1993–2005) and former editor of the journal *Biodiversity*, he played an important role in scientific publishing in Canada. Active in the

policy and advisory work of the Royal Society of Canada, he was elected a fellow in 1975. The culmination of all this national work was his appointment to the Order of Canada (2002) and his reception of both the Queens' Golden Jubilee Medal (2002) and the Queen's Diamond Jubilee Medal (2012).

Geoff has been recognized internationally. Involved in the American Association for the Advancement of Science, he was president of the Pacific Division (1985–1986) and an executive member for many years; he was elected a Fellow in 1998. His interest in the biology of the lands in and around the Pacific Ocean stimulated his long commitment to the Pacific Science Association, which as well as being a catalyst for scientific collaboration, engages science in improving both the environment and quality of human life of the region. From 1976 to 1995, Geoff was either chair of its Scientific Committee on Entomology or a member of the executive board; he was vice-president from 1991 to 1995. He played a large role in the organization of the International Congress of Systematic and Evolutionary Biology, being the chair of the organizing committee (1978–1980) and co-President (1980–1985).

Perhaps his largest contribution on this front was the hosting of the XVIII International Congress of Entomology in Vancouver in 1988; he was the President and Secretary General of the Congress and ran most of it out of the Zoology Head's office at UBC. This huge meeting was a resounding success on all fronts, but Geoff will probably be most fondly remembered for the huge beer tent that served as a convenient and popular meeting and discussion place for all participants.

Geoff Scudder led us by his example—love of nature, hard work, and scholarship. Geoff's energy, commitment, and accomplishments profoundly affected entomology, both nationally and internationally, and all the diverse aspects of Canadian science that he championed (Figure 8). His profound influence lives on through the work of those in his academic lineage and in the institutions that surround and support the entomological community. May the force and inspiration of his example carry us forward in pursuit of increased understanding of the world around us, just as he would have desired.

This article is based on the Introduction to a special issue of *The Canadian Entomologist* in tribute to Geoff Scudder (Cannings 2006).

Acknowledgements

We thank Robb Bennett, Dick Cannings, Murray Isman, Joan Kerik, and Jacky and Nicola Scudder for comments on a draft of the manuscript. Murray Isman and Hugh Danks provided especially valuable insights from their work with Geoff. Launi Lucas supplied background information and Figure 1. Jasper Lament and Dominique Bowden (The Nature Trust of BC) provided Figures 7 and 8.

References

- Acton, A.B. and Scudder, G.G.E. 1969. The ultrastructure of the flight muscle polymorphism in *Cenocorixa bifida* (Hung.) (Heteroptera, Corixidae). *Zeitschrift für Morphologie der Tiere*, **65**: 32–335.
- Bennett, A.M.R. and Scudder, G.G.E. 1998. Differences in attachment of water mites on water boatmen: further evidence of differential parasitism and possible exclusion of a host from part of its potential range. *Canadian Journal of Zoology*, **76**: 824–834.



Figure 8. Geoff Scudder.

The Nature Trust of BC

- Cannings, R.A. 2006. Geoffrey G.E. Scudder: zoologist, conservationist, educator. *The Canadian Entomologist*, **138** (4): ix–xix.
- Cannings, R.A., Cannings, S.G. and Scudder, G.G.E. 2001. Insect collections, surveys and conservation in British Columbia in the 20th century. *Journal of the Entomological Society of British Columbia*, **98**: 17–32.
- Cannings, S.G., Cooper, P.D. and Scudder, G.G.E. 1988. Effect of temperature on rate of water loss in some water boatmen (Hemiptera: Corixidae). *Canadian Journal of Zoology*, **66**: 1877–1883.
- Cannings, R.A. and Scudder, G.G.E. 1978. The littoral Chironomidae (Diptera) of saline lakes in central British Columbia. *Canadian Journal of Zoology*, **56**: 1144–1155.
- Cannings, R.A. and Scudder, G.G.E. 1979. Phenology of *Chironomus* spp. in saline lakes of central British Columbia. *Verhandlungen Internationale Vereinigung für theoretische und angewandte Limnologie*, **20**: 2641–2646.
- Cannings, R.A. and Scudder, G.G.E. 2001. An overview of systematic studies concerning the insect fauna of British Columbia. *Journal of the Entomological Society of British Columbia*, **98**: 33–39.
- Danks, H.V. (Ed.) 1979. Canada and its insect fauna. *Memoirs of the Entomological Society of Canada*, **108**: 1–573.
- Footitt, R.G., Maw, H.E.L., Kits, J.H. and Scudder, G.G.E. 2019. Hemiptera of Canada. *In* The Biota of Canada—A Biodiversity Assessment. Part. 1. The Terrestrial Arthropods. *Edited by* D.M. Langor and C.S. Sheffield. *Zookeys*, **819**: 277–290.
- Isman, M.B., Duffey, S.S. and Scudder, G.G.E. 1977. Cardenolide content of some leaf- and stem-feeding insects on temperate North American milkweeds (*Asclepias* spp.). *Canadian Journal of Zoology*, **55**: 1024–1028.
- Jamieson, G.S. and Scudder, G.G.E. 1977. Food consumption in *Gerris* (Hemiptera). *Oecologia*, **30**: 23–41.
- Jansson, A. and Scudder, G.G.E. 1974. The life cycle and sexual development of *Cenocorixa* species (Hemiptera, Corixidae) in the Pacific Northwest of North America. *Freshwater Biology*, **4**: 73–92.
- Jarial, M.S. and Scudder, G.G.E. 1970. The morphology and ultrastructure of the Malpighian tubules and hindgut in *Cenocorixa bifida* (Hung.) (Hemiptera, Corixidae). *Zeitschrift für Morphologie die Tiere*, **68**: 269–299.
- Jarial, M.S. and Scudder, G.G.E. 1971. Neurosecretion and water balance in *Cenocorixa bifida* (Hung.) (Hemiptera, Corixidae). *Canadian Journal of Zoology*, **49**: 1369–1375.
- Kevan, D.K.McE. and Scudder, G.G.E. 1989. Illustrated keys to the families of terrestrial arthropods of Canada. I. Myriapods (Millipedes, Centipedes, etc.). *Biological Survey of Canada Taxonomic Series*, **1**: 1–88.
- Klimaszewski, J., Langor, D., Batista, R., Duval, J.-A., Majka, C.G., Scudder, G.G.E. and Bousquet, Y. 2012. Synopsis of adventive species of Coleoptera (Insecta) recorded from Canada. Part 1: Carabidae. Pensoft, Sofia–Moscow.
- Lancaster, J. and Scudder, G.G.E. 1987. Aquatic Coleoptera and Hemiptera in some Canadian saline lakes: patterns in community structure. *Canadian Journal of Zoology*, **65**: 1383–1390.
- Larson, D.J. and Scudder, G.G.E. 2018. Seed bugs and their allies (Hemiptera: Heteroptera: Lygaeoidea) of the Canadian Prairie Provinces. *Canadian Journal of Arthropod Identification*, **34**: 1–174.
- Maw, H.E.L., Footitt, R.G., Hamilton, K.G.A. and Scudder, G.G.E. 2000. Checklist of the Hemiptera of Canada and Alaska. NRC Research Press, Ottawa, Ontario.
- Moore, L.V. and Scudder, G.G.E. 1985. Ouabain-resistant Na, K-ATPases and cardenolide tolerance in the Large Milkweed Bug, *Oncopeltus fasciatus*. *Journal of Insect Physiology*, **32**: 27–33.
- Nagorsen, D.W., Scudder, G.G.E., Huggard, D., Stewart, H. and Panter, N. 2001. Merriam's Shrew, *Sorex merriami* and Preble's Shrew, *Sorex preblei*: two new mammals for Canada. *Canadian Field-Naturalist*, **115**: 1–8.
- Oloffs, P.C. and Scudder, G.G.E. 1966. The transition phenomenon in relation to the penetration of water through the cuticle of an insect, *Cenocorixa expleta* (Uhler). *Canadian Journal of Zoology*, **44**: 621–630.
- Pohl, G.R., Cannings, R.A., Landry, J.-F., Holden, D.G. and Scudder, G.G.E. 2015. Checklist of the Lepidoptera of British Columbia, Canada. *Entomological Society of British Columbia Occasional Paper* 3.
- Ratzlaff, C.G., Needham, K.M. and Scudder, G.G.E. 2017. Notes on insects recently introduced to Metro Vancouver and other newly recorded species from British Columbia. *Journal of the Entomological Society of British Columbia*, **113**: 79–89.
- Reynolds, J.D. and Scudder, G.G.E. 1987. Serological evidence of realized feeding niche in *Cenocorixa* species (Hemiptera: Corixidae) in sympatry and allopatry. *Canadian Journal of Zoology*, **65**: 974–980.

- Rowe, L. and Scudder, G.G.E. 1990. Reproductive rate and longevity in the waterstrider *Gerris buenoi*. Canadian Journal of Zoology, **68**: 399–402.
- Sandercock, G.A. and Scudder, G.G.E. 1996. Key to the species of freshwater calanoid copepods of British Columbia. Resources Inventory Committee publication. Ministry of Environment, Lands and Parks, Victoria, British Columbia.
- Schindler, D. and Scudder, G. 1999. The politics and science of extinction. National Post. 26 November 1999: A18.
- Scudder, G.G.E. 1956a. A contribution to a survey of the distribution of the Hemiptera-Heteroptera of Wales. Entomologists' Monthly Magazine, **92**: 54–64.
- Scudder, G.G.E. 1956b. A revision of the genus *Appolonius* Distant (Hemiptera, Lygaeidae) with a new species from South Sudan. Entomologists' Monthly Magazine, **92**: 359–360.
- Scudder, G.G.E. 1957a. A revision of the genus *Meschia* Distant (Heteroptera: Lygaeidae) with a new species from South Queensland. Proceedings of the Royal Society of Queensland, **68**: 25–28.
- Scudder, G.G.E. 1957b. Re-interpretation of some basal structures in the insect ovipositor. Nature, **180**: 340–341.
- Scudder, G.G.E. 1957c. The higher classification of the Rhyparochrominae (Hemiptera, Lygaeidae). Entomologists' Monthly Magazine, **93**: 152–156.
- Scudder, G.G.E. 1957d. The ovipositor of the Thysanura and its interpretation in the higher insect orders. Proceedings of the Royal Entomological Society of London (C), **22**: 47–48.
- Scudder, G.G.E. 1959. The female genitalia of the Heteroptera: morphology and bearing on classification. Transactions of the Royal Entomological Society of London, **111**: 405–467.
- Scudder, G.G.E. 1961a. The comparative morphology of the insect ovipositor. Transactions of the Royal Entomological Society of London, **113**: 25–40.
- Scudder, G.G.E. 1961b. The functional morphology and interpretation of the insect ovipositor. The Canadian Entomologist, **93**: 267–272.
- Scudder, G.G.E. 1962. The World Rhyparochrominae (Hemiptera: Lygaeidae). I. New synonymy and generic changes. The Canadian Entomologist, **94**: 764–473.
- Scudder, G.G.E. 1963. Studies on the Canadian and Alaskan Fulgoromorpha (Hemiptera). I. The genera *Achrotile* Fieber and *Laccocera* Van Duzee (Delphacidae). The Canadian Entomologist, **95**: 167–177.
- Scudder, G.G.E. 1966. The immature stages of *Cenocorixa bifida* (Hung.) and *C. expleta* (Uhler) (Hemiptera: Corixidae). Journal of the Entomological Society of British Columbia, **63**: 33–40.
- Scudder, G.G.E. 1969. The fauna of saline lakes on the Fraser Plateau in British Columbia. Vereinigung für theoretische und angewandte Limnologie, **17**: 430–439.
- Scudder, G.G.E. 1971a. Comparative morphology of insect genitalia. Annual Review of Entomology, **16**: 379–406.
- Scudder, G.G.E. 1971b. The Gerridae (Hemiptera) of British Columbia. Journal of the Entomological Society of British Columbia, **68**: 3–10.
- Scudder, G.G.E. 1971c. The osmoregulation and distribution of two species of *Cenocorixa* (Hemiptera). Proceedings of the XIII International Congress of Entomology, Moscow, **1**: 555–556.
- Scudder, G.G.E. 1971d. The postembryonic development of the indirect flight muscles in *Cenocorixa bifida* (Hung.) (Hemiptera: Corixidae). Canadian Journal of Zoology, **49**: 1387–1398.
- Scudder, G.G.E. 1971e. New Lygaeidae (Hemiptera) from the Niokolo-Koba National Park, Senegal. Bulletin IFAN, **33**: 718–736.
- Scudder, G.G.E. 1972. Industrial melanism: a possibility in British Columbia. Journal of the Entomological Society of British Columbia, **69**: 46–48.
- Scudder, G.G.E. 1973. Recent advances in the higher systematics and phylogenetic concepts in entomology. The Canadian Entomologist, **105**: 1251–1263.
- Scudder, G.G.E. 1974. Species concepts and speciation. Canadian Journal of Zoology, **52**: 1121–1134.
- Scudder, G.G.E. 1975. Field studies on the flight muscle polymorphism in *Cenocorixa* (Hemiptera: Corixidae). Verhandlungen Internationale Vereinigung für theoretische und angewandte Limnologie, **19**: 3064–3072.
- Scudder, G.G.E. 1976a. An annotated checklist of the Ephemeroptera (Insecta) of British Columbia. Syesis, **8**: 311–315.
- Scudder, G.G.E. 1976b. Water-boatmen of saline waters (Hemiptera: Corixidae). In Marine Insects. Edited by L. Cheng. North Holland Publishing Company, Amsterdam, The Netherlands. pp. 263–289.

- Scudder, G.G.E. 1979a. Present patterns in the fauna and flora of Canada. *In* Canada and its insect fauna. Edited by H.V. Danks. *Memoirs of the Entomological Society of Canada*, **108**: 87–179.
- Scudder, G.G.E. 1979b. The nature and strategy of species. *In* Canada and its insect fauna. Edited by H.V. Danks. *Memoirs of the Entomological Society of Canada*, **108**: 533–547.
- Scudder, G.G.E. 1980. The Osoyoos-Arid Biotic Area. *In* Threatened and endangered species and habitats in British Columbia and the Yukon. Edited by R. Stace-Smith, L. Johns and P. Joslin. BC Ministry of Environment, Fish and Wildlife Branch, Victoria, British Columbia. pp. 49–55.
- Scudder, G.G.E. 1984. The World Rhyparochrominae (Hemiptera: Lygaeidae). XVIII. The genus *Sinierus* Distant. *The Canadian Entomologist*, **116**: 427–434.
- Scudder, G.G.E. 1987. Aquatic and semiaquatic Hemiptera of peatlands and marshes in Canada. *Memoirs of the Entomological Society of Canada*, **140**: 65–98.
- Scudder, G.G.E. 1989. The adaptive significance of marginal populations: a general perspective. *In* Proceedings of the National Workshop on effects of habitat alteration of salmonid stocks. Edited by C.D. Levings, L.B. Holby and M.A. Henderson. Canadian Special Publications in Fisheries and Aquatic Sciences, **105**: 180–185.
- Scudder, G.G.E. 1991. The stilt bugs (Hemiptera: Berytidae) of Canada. *The Canadian Entomologist*, **123**: 425–438.
- Scudder, G.G.E. 1993a. Geographic distribution and biogeography of representative species of xeric grassland-adapted Nearctic Lygaeidae in Western North America (Insecta: Heteroptera). *Memoirs of the Entomological Society of Canada*, **165**: 75–113.
- Scudder, G.G.E. 1993b. The Okanagan Basin - an ecological overview of a national treasure. *In* Preserving Biodiversity and Unique Ecosystems of the Okanagan-Similkameen Region, Proceedings of Land for Nature Workshop, Summerland, BC, 26 February 1993. Federation of BC Naturalists, Vancouver, British Columbia. pp. 3–10.
- Scudder, G.G.E. 1994. An annotated systematic list of the potentially rare and endangered freshwater and terrestrial invertebrates in British Columbia. *Occasional Papers of the Entomological Society of British Columbia* **2**: 1–92.
- Scudder, G.G.E. 1996a. Terrestrial and Freshwater Invertebrates of British Columbia: Priorities for Inventory and Descriptive Research. Working Paper 09, Research Branch, BC Ministry of Forests and Wildlife Branch, BC Ministry of Environment, Lands and Parks. Victoria, British Columbia.
- Scudder, G.G.E. 1996b. The Protected Areas Strategy and Biodiversity Conservation. *In* The Wilderness Vision for British Columbia. Proceedings of a colloquium on completing British Columbia's protected area system. Vancouver, BC, March 1994. Edited by S. Jessen. Canadian Parks and Wilderness Society, Vancouver, BC. pp. 99–101.
- Scudder, G.G.E. 1997a. Environment of the Yukon. *In* Insects of the Yukon. Edited by H.V. Danks and J.A. Downes. Biological Survey of Canada (Terrestrial Arthropods), Ottawa, Ontario. pp. 13–57.
- Scudder, G.G.E. 1997b. True Bugs (Heteroptera) of the Yukon. *In* Insects of the Yukon. Edited by H.V. Danks and J.A. Downes. Biological Survey of Canada (Terrestrial Arthropods), Ottawa, Ontario. pp. 241–336.
- Scudder, G.G.E. 1998. Heteroptera. *In* Assessment of species diversity in the Montane Cordillera Ecozone. Edited by G.G.E. Scudder and I.M. Smith. Ecological Monitoring and Assessment Network, Burlington, Ontario.
- Scudder, G.G.E. 1999. Endangered species protection in Canada. *Conservation Biology*, **13**: 963–965.
- Scudder, G.G.E. 2000a. The Osoyoos Desert Society: experimental studies on ecological restoration of the shrub-steppe habitat. *In* At Risk: Proceedings of a Conference on the Biology and Management of Species and Habitats at Risk. Kamloops, British Columbia, 15–19 February 1999. Edited by L.M. Darling. BC Ministry of Environment, Lands and Parks, Victoria, British Columbia and University College of the Cariboo, Kamloops, British Columbia. pp. 797–800.
- Scudder, G.G.E. 2000b. Biodiversity: concerns and value. *In* Conserving Nature's Diversity: Insights from Biology, Ethics and Economics. Edited by G.C. van Kooten, E.H. Bulte and A.R.E. Sinclair. Ashgate Publishing, Adlershot, UK. pp. 16–29.
- Scudder, G. 2000c. Our wildlife are on life support. *The Globe and Mail*. 21 February 2000: A15.
- Scudder, G.G.E. 2002. Endangered species legislation in Canada. *In* Proceedings of 40th Annual Meeting, Canadian Society of Environmental Biologists, Toronto, ON. pp. 36–40.

- Scudder, G.G.E. and Duffey, S.S. 1972. Cardiac glycosides in the Lygaeinae (Hemiptera: Lygaeidae). *Canadian Journal of Zoology*, **50**: 35–42.
- Scudder, G.G.E. 2008. Threads and serendipity in the life and research of an entomologist. *Annual Review of Entomology*, **53**: 1–17. 10.1146/annurev.ento.53.110106.153010
- Scudder, G.G.E. 2010a. True bugs (Heteroptera) of the Atlantic Maritime Ecozone. *In* Assessment of Species Diversity in the Atlantic Maritime Ecozone. *Edited by* D.F. McAlpine and I.M. Smith. NRC Research Press, Ottawa, Ontario. pp. 381–403.
- Scudder, G.G.E. 2010b. Grasslands: Biodiversity hotspots for some arthropods in British Columbia. *In* Arthropods of Canadian Grasslands. Volume 1. Ecology and Interactions in Grassland Habitats. *Edited by* J.D. Shorthouse and K.D. Floate. Biological Survey of Canada Monograph Series No. 3. pp. 121–134.
- Scudder, G.G.E. 2012. *Monosteira unicolorata* (Mulsant & Rey) (Hemiptera: Tingidae) established in North America, with a key to the genera of Tingidae in Canada. *Entomologica Americana*, **118**: 295–297.
- Scudder, G.G.E. 2016. A review of the genus *Entisberus* Distant (Hemiptera: Heteroptera: Rhyparochromidae: Drymini). *Zootaxa*, **4083**: 143–150.
- Scudder, G.G.E. 2017. The importance of insects. *In* Insect Biodiversity: Science and Society. Volume 1, Second Edition. *Edited by* R.G. Footitt and P.H. Alder. John Wiley & Sons. pp. 9–43.
- Scudder, G.G.E. 2019. The systematic position of *Pamera noctuabunda* Bergroth, 1907 (Hemiptera: Heteroptera: Rhyparochromidae), with a revised key to the species of *Stalaria* Harrington, 1980. *Zootaxa*, **4691**: 293–296.
- Scudder, G.G.E. 2021. *Oxycarenus breddini* Bergroth, 1905 (Hemiptera: Heteroptera: Oxycarenidae): syntypes discovered, lectotype selection and new type set aside. *The Canadian Entomologist*, **153**: 497–499.
- Scudder, G.G.E., Alperyn, M.A. and Roughley, R.E. 2010. Aquatic Hemiptera of the prairie grasslands and parklands. *In* Arthropods of Canadian Grasslands. Volume 1. Ecology and Interactions in Grassland Habitats. *Edited by* J.D. Shorthouse and K.D. Floate. Biological Survey of Canada Monograph Series No. 3. pp. 303–323.
- Scudder, G.G.E. and Cannings, R.A. 2009. A checklist of the neuropterid insects of British Columbia (Insecta: Megaloptera, Neuroptera and Raphidioptera) with a summary of their geographic distribution. *Journal of the Entomological Society of British Columbia*, **106**: 17–23.
- Scudder, G.G.E. and Footitt, R.G. 2006. Alien true bugs (Hemiptera: Heteroptera) in Canada: composition and adaptations. *The Canadian Entomologist*, **138**: 24–51.
- Scudder, G.G.E. and Gessler, N. (eds.) 1989. The Outer Shores: Proceedings of the Queen Charlotte Islands International Symposium, Vancouver, British Columbia, 21–24 August 1984. Queen Charlotte Islands Museum Press, Queen Charlotte City, BC.
- Scudder, G.G.E., Jarial, M.S. and Choy, S.K. 1972. Osmotic and ionic balance in two species of *Cenocorixa* (Hemiptera). *Journal of Insect Physiology*, **18**: 883–895.
- Scudder, G.G.E. and Meredith, J. 1972. Temperature-induced development in the indirect flight muscle of adult *Cenocorixa* (Hemiptera: Corixidae). *Developmental Biology*, **29**: 330–336.
- Scudder, G.G.E. and Meredith, J. 1982. Morphological basis of cardiac glycoside sequestration by *Oncopeltus fasciatus* (Dallas) (Hemiptera: Lygaeidae). *Zoomorphology*, **99**: 87–101.
- Scudder, G.G.E., Moore, L.V. and Isman, M.B. 1986. Sequestration of cardenolides in *Oncopeltus fasciatus*: morphological and physiological adaptations. *Journal of Chemical Ecology*, **12**: 1171–1187.
- Scudder, G.G.E. and Schwartz, M.D. 2001. The genus *Leptopterna* Fieber (Heteroptera: Miridae: Stenodemini) in North America. *Proceedings of the Entomological Society of Washington*, **103**: 797–806.
- Scudder, G.G.E. and Smith, I.M. 1998. Introduction and Summary. *In* Assessment of species diversity in the Montane Cordillera Ecozone. *Edited by* G.G.E. Scudder and I.M. Smith. Ecological Monitoring and Assessment Network, Burlington, Ontario.
- Shah, R.M., Donaldson, E.M. and Scudder, G.G.E. 1990. Toward the origin of the secondary palate. A possible homologue in the embryo of fish, *Oncorhynchus kisutch*, with description of changes in the basement membrane area. *American Journal of Anatomy*, **189**: 329–338.
- Southwood, T.R.E. and Scudder, G.G.E. 1956. The bionomics and immature stages of the thistle lace bugs (*Tingis ampliata* H.-S. and *T. cardui* L.; Hem., Tingidae). *Transactions of the Society for British Entomology*, **12**: 93–112.

- Spence, J.R. and Scudder, G.G.E. 1980. Habitats, life cycles, and guild structure among water striders (Heteroptera: Gerridae) on the Fraser Plateau of British Columbia. *The Canadian Entomologist*, **112**: 779–792.
- Spence, J.R., Spence, D.H. and Scudder, G.G.E. 1980a. Submergence behavior in *Gerris*: underwater basking. *American Midland Naturalist*, **103**: 385–391.
- Spence, J.R., Spence, D.H., and Scudder, G.G.E. 1980b. The effects of temperature on growth and development in water-striders (Gerridae) and implications for species packing. *Canadian Journal of Zoology* **58**: 1813–1820.
- Vickery, V.R. and Scudder, G.G.E. 1987. The Canadian Orthopteroid insects summarized and updated, including a tabular checklist and ecological notes. *Proceedings of the Entomological Society of Ontario*, **118**: 25–45.
- Warman, L.D., Sinclair, A.R.E., Scudder, G.G.E., Klinkenberg, B. and Pressey, R.L. 2004. Sensitivity of systematic reserve selection to decisions about scale, biological data and targets - a case study from southern British Columbia. *Conservation Biology*, **18**: 655–666.
- Winchester, N.N. and Scudder, G.G.E. 1993. Methodology for sampling terrestrial arthropods in British Columbia. Resources Inventory Committee publication. BC Ministry of Environment, Lands and Parks, Victoria, British Columbia.
- Yack, J.E., Scudder, G.G.E. and Fullard, J.H. 1999. Evolution of the metathoracic tympanal ear and its mesothoracic homologue in Macrolepidoptera (Insecta). *Zoomorphology*, **119**: 93–103.
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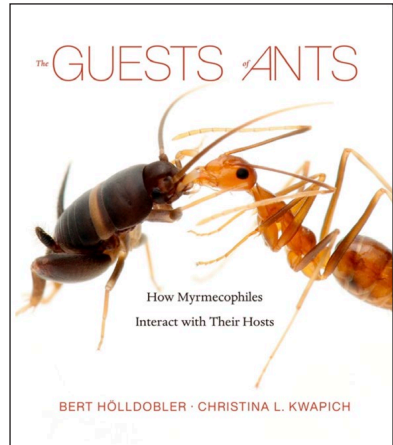
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The Guests of Ants: How Myrmecophiles Interact with Their Hosts. Hölldobler, B. and Kwapich, C.L. 2022. Harvard University Press. Hardcover. ISBN 9780674265516 CAN\$ 90.95.

The results of coevolution are often bizarre and beautiful. In “The Guests of Ants: How Myrmecophiles Interact with Their Hosts”, authors Bert Hölldobler and Christina L. Kwapich show how the coevolution between ants and their many associates has led to some truly strange and astonishing behavioural and physiological innovations. The authors take us deep into the nests of ants, where a variety of other species have taken up residence. There are examples of flies, butterflies, beetles, crickets, cockroaches, true bugs, spiders, and wasps; and even fungi and vertebrates—all occupying various nooks and crannies of ant nests, and each taking advantage of the elaborate infrastructure of ant society. These myrmecophiles (the so-called “guests”) have complex relationships with their hosts, both mutualistic and parasitic. They employ a bevy of tactics to integrate themselves into ant nests, including camouflage, mimicry, and what the authors call “identity theft”. Some prey on the ant brood, some steal food from nest caches, and still others elicit trophallaxis and take food straight from the mouths of their hosts. Conversely, some myrmecophiles feed their ant associates with special secretions, and receive protection for their service. This book is a stunning collection of these stories of myrmecophiles living with ants, with rich accounts of the interactions between guests and hosts. The content is primarily a description of natural history and behaviour, though the authors devote significant chunks to discussion of systematics. The structure of the book itself jumps between chapters organized around endosymbiotic lifestyle to endosymbiotic taxa. One long chapter is dedicated entirely to the family Lycaenidae - the speciose gossamer-winged butterflies, many of whose caterpillars provide food secretions for their ant mutualists (whereas others have evolved to be ant parasites). Many other known examples of ant associates are left out, but the authors make it clear that the book is not meant to be comprehensive, but rather a “behavioural natural history of a selected group of myrmecophiles”. Even for only covering a select group, there is no shortage of content (the book is 576 pages) and the authors still manage to cover an impressive number of cases of myrmecophily. The book covers a wide breadth of primary literature, pulling from a long tradition of ant research. Often, the authors outline the conclusions laid out in these studies and offer their own thoughts when their interpretation differs. This practice nicely highlights open questions and areas still contentious in the field.

A major feature of this book is its superb photography. The minute world of the ants and their guests is captured in vivid close-up images provided by world-class insect photographers (including the authors themselves). I could not resist the urge to present the photos in this book to any captive audience—showing off the book once at a lab meeting, once over a Zoom call, and even hauling it out at a dinner party. It is hard to say if everyone was as delighted by these bizarre life histories as I was, but at least one friend seemed to experience some existential dread after learning about the lifecycle of the myrmecophile *Strongygaster globula* when he proclaimed, “Why would such a thing exist?” In this example, a founding queen *Lasius niger* ant deposits a final instar larva from her cloaca and tends to it throughout its pupation. Upon eclosion, though, it is an adult tachinid fly, not an ant, that emerges from the pupal casing. The young queen then chases the imposter out of her incipient nest. The book is filled with delightful horrors such as this. Although



they may unintentionally stir up metaphysical questions, the authors discuss their topic with sober, unadorned prose. Yet, their descriptions conjure a gripping narrative for each example they lay out. After each subsection I found myself pausing to exclaim “wow!”. This book is an impressive debut from author Chistina L. Kwapich, and a serious contender for most enjoyable book from author Bert Hölldobler.

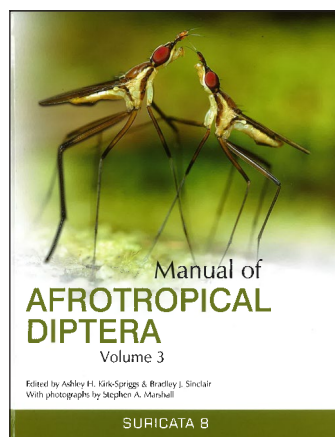
“The Guests of Ants” purports to be a coffee table book, but the writing is closer to that of a scientific text for professional biologists. A glossary is provided at the end, but beyond that the authors do not devote space explaining advanced concepts or defining terminology (aside from some extremely niche myrmecological jargon). Its medium-large size (approximately 20 cm x 24 cm) accommodates its large photographs, but the images do not dominate the volume like a typical coffee table book. The ideal audience is probably biologists and biology students, especially those with a focus on either symbioses or sociobiology. Yet, the captivating nature of the content and the spectacular photography should make the book enticing to laypeople with a passion for insects. It would be particularly well-suited for a lab book club or departmental reading group, especially one with undergraduate students in attendance. Each chapter will be sure to spark vibrant discussion, and to entertain and inspire the next generation of human myrmecophiles.

Alexander Walton
University of Alberta

Manual of Afrotropical Diptera, Volume 3. Brachycera-Cyclorrhapha, excluding Calypterae. Kirk-Spriggs, A.H. and Sinclair, B.J., editors. 2021. South African National Biodiversity Institute (SANBI), Pretoria, South Africa. 1016 pp. ISBN 978-1-928224-13-6. Hardcover. ~CAN\$165.

It was almost five years ago to the day that I wrote a review of the first two volumes of the *Manual of Afrotropical Diptera* (MAD). Many, many international events have occurred in that length of time. Perhaps that is sufficient explanation as to why the third volume has been delayed for so long. The summer of 2023 was the first chance I had to get a hard copy of the book, as it was formally launched at the Tenth International Congress of Dipterology held in Reno, Nevada.

Manual of Afrotropical Diptera Volume 3 is the third in a planned four-part work covering all of the Diptera of the Afrotropical region. The first volume provided foundational, background chapters, including keys to identify both adults and larva to the family level. The second volume included individual chapters on 43 families of “Nematocera” and “lower Brachycera”. The newest volume tackles 51 families comprising the Acalypterae, plus Phoroidea and Syrphoidea—from the Platypezidae to the Cryptochetidae. The life history, ecology, morphology, classification, and proposed phylogeny of each family is provided in detail. Each family chapter contains at least a dichotomous key to genus for adults, while some also include a key for immature stages. Also included is a brief summary of the diversity and available literature for each genus included in each key. Every chapter is richly illustrated with line drawings or high-quality microphotographs. The choice of format may differ from author to author, but it is clear that the best, and most informative, illustrations were included in every case. It is this modern use of clear depictions of the morphological structures used in the keys that makes these manuals so useful to experts and laypeople alike.



Diverse, global, and charismatic families of Diptera (e.g., Syrphidae) are certainly a highlight of this volume. They make for beautiful *in situ* photographs (once again provided by Dr. Stephen Marshall), but are also of immediate importance to those pursuing general survey work or targeted pollinator studies in the Afrotropical region. Also of particular interest are the Diptera endemic to sub-Saharan Africa. The nearly eyeless and wingless Mormotomyiidae are found only in bat caves in eastern Kenya. The Natalimyziidae are a monogeneric family of grass flies of uncertain placement within any of the acalyptrate superfamilies. This book is the place to go to learn about bizarre flies found only in Africa.

The book is published in a high-quality format, but its length, and subsequent mass, is prohibitive. At over one thousand pages and nearly five kilos, this book sits well next to a microscope, but is not easily thrown into a backpack for transport. Despite the size, the relative cost is still quite low and shipping is available nearly everywhere in the world. Even so, if the cost or size is discouraging enough for a dipterist, the book is available for free download. Simply by clicking here <opus.sanbi.org>, a pdf of the entire work is available for immediate use. It is the comprehensive nature and emphasis on accessibility that makes manuals of this sort of such immense value to the entomological community.

A continuing theme of these volumes is the large number of as yet undescribed species and genera within almost every family. It is abundantly clear that much more work needs to be done to understand the dipteran diversity of the African continent. Perhaps by making this work freely available, it will encourage and enable new workers to take up the task.

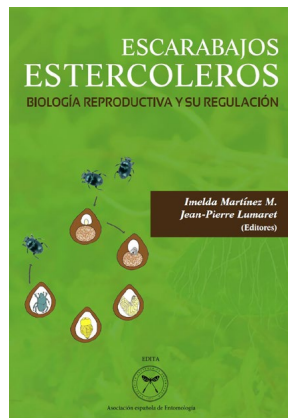
Dr Joel Gibson
Royal BC Museum
Victoria, BC

Escarabajos estercoleros. Biología reproductiva y su regulación.

Martínez, M. I. and Lumaret, J.P. (Editors). 2022. Edita Asociación Española de Entomología. 406 pp. (In Spanish – English title: Dung beetles: Reproductive biology and its regulation). Asociación española de Entomología ISBN: 978-84-09-4814-84.

Free download: https://www.researchgate.net/publication/368751014_2022_Martinez_M_I_y_Lumaret_J_P_Eds_Escarabajos_del_estiercol_Biologia_reproductiva_y_su_regulacion

Over the last fifty years or so, the curious and fascinating world of dung beetles has become a broad and vibrant field of study approached from myriad points of view by an ever-increasing community of taxonomists, behaviorists, ecologists, evolutionists, physiologists, conservationists, biogeographers, as well as even a historian or two. While each line of study has its main protagonists, basic literature, research techniques, and so forth, the entire endeavour is very much interdisciplinary and focused on the intrinsic nature of these insects, their diversity, and their place in the biosphere. As research activity has grown exponentially, it has generated an extensive body of new information, interpretations and insights that, just to remain accessible by the community at large, demand that, periodically, someone assume the task of compiling and summarizing what we have come to know, what we think it means, and what questions remain. These syntheses become the steppingstones on a path leading to new inquiry. They are the critical pauses to reflect and inform that stimulate curiosity and further inquiry.



This book is a steppingstone in the path of inquiry into the reproductive lives of dung beetles. Imelda Martínez-M. and Jean-Pierre Lumaret have assembled a remarkable first synthesis of our current knowledge of the reproductive biology of scarabaeoid dung beetles (the Geotrupidae and the subfamilies Aphodiinae and Scarabaeinae of Scarabaeidae). Their effort is dedicated to the late Gonzalo Halffter, a preeminent authority on dung beetle natural history and first-author of two other important syntheses: *The Natural History of Dung Beetles* (1966, with E.G. Matthews) and *The Nesting Behavior of Dung Beetles* (1981, with W.D. Edmonds). Its 406 pages comprise eight chapters, each with its own authorship, bibliography and conclusions. The literature cited is collectively a bibliographic gold mine, bringing together roughly 1000 references on dung beetle reproductive biology as well as ancillary references of enduring importance.

Chapter 1 (Carmen Huerta and Magdalena Cruz R.) is a brief review of dung beetle reproductive behaviour, including mating, courtship and nesting behaviours. Here the authors present an updated conceptual and descriptive framework from the simplest to most complex spectrum of behavioural strategies known for these beetles, mainly in the context of Halffter and Edmonds' 1981 work on nesting behaviour. Of particular note is much new information on copulatory, food relocation, and nesting behaviours, especially in Scarabaeinae. As the authors point out, while the body of information on reproductive behaviors has grown considerably since the 1980s, most has been based on laboratory studies, leaving the door open for significant contributions from field observation. The literature cited comprises 107 references, of which 61 (57%) were published since 2000, and 38 (35%) before 1990.

Chapter 2 (Imelda Martínez-M. and Sara Lariza Rivera-Gasperín) details the anatomy, histology and function of the female and male reproductive systems. The chapter relies heavily on early (pre-1990) accounts but includes a wealth of updated information. Of the 179 cited works, 99 (55%) were published before 1990; 49 (27%), since 2000. Of particular note is the conclusion that, in the context of reproductive structure and function comparisons presented, neither Scarabaeinae nor Aphodiinae are especially closely related to the Geotrupidae.

Chapter 3 (Imelda Martínez-M, Jean-Pierre Lumaret and Marco Dellacasa) focuses on life cycles and development of the larval stages, with emphasis on where development unfolds, from development within an unmodified food source to development within nests of variably complex architecture. The authors present several extensive tables summarizing available information on larval morphology and development; of special usefulness are Tables 2, 5 and 7, which list cited works containing larval descriptions. As published accounts are very rare, the pupal stage receives only passing mention. Bibliographic references are extensive, 205 citations published between 1885 and 2022, most (>50%) from the 1970s and 1980s.

Chapter 4 (Imelda Martínez-M. and Carmen Huerta C.) examines the morpho-physiological aspects of sexual maturation of adults, especially the structural development of the ovaries and vitellogenesis in females and glandular activity in males. The physiology of dung beetle reproductive cycles is given broad and meaningful treatment in this chapter as it lays out the fundamental phases in sexual maturation—pre-nidification, nidification and post-nidification—each closely linked to feeding regimen and gonadal maturation in both sexes. Of the 104 references cited, 58 (58%) appeared in the 1980s and 1990s, while 86% appeared from 1980 to the present.

Chapter 5 (Imelda Martínez-M. and Jean-Pierre Lumaret) treats environmental (climatic and ecological) and physiological factors (especially the neurohormonal system) regulating development and reproductive cycles. Factors considered are temperature, photoperiod and humidity as well as the olfactory environment (ecochemicals) produced by food odours and semiochemicals. Completing the picture is an important narrative on the regulation of ovarian development in Scarabaeinae as influenced by external factors as well as nutritional state, fat body activity and development of oocytes. Of particular note is the discussion of reproductive regulation in Scarabaeinae, especially the roles of neurosecretion and ovarian development and the correlation of nesting behavior and activity in the corpora allata and pars intercerebralis of the brain. This

chapter, by far the longest in the book, summarizes much recently published information about reproductive regulation on the cellular and tissue scale summarized in Figure 13 (p. 262). The 20-page bibliography is extensive, comprising 298 citations that mirror an increased research effort in recent years: 67% of the cited references have appeared since 1990, 43% since 2000, and almost 10% in the current decade. Indeed, the authors of this chapter are themselves among the more productive contributors, having produced, as first authors, 35 (12%) of the citations.

Chapter 6 (Mario E. Favila) reviews the nature and role of pheromones and other semiochemicals in the lives of dung beetles, a relatively new focus of dung beetle research. Its bibliography comprises 106 citations, half of which have appeared in the last 20 years. Earlier work in the 1980s and early 1990s on integumental glands presaged important work by the author of this chapter and others on the nature functions of their products. In this context, Dr. Favila has contributed significant insight into their role of these secretions in the of ball-rolling scarabaeines, especially in the necrophagous canthonine, *Canthon cyanellus*. The basis and role of chemical communications in these beetles is as of yet only poorly understood. But it has become certain that they are critical in intraspecific and interspecific interactions, not only in a sexual context, but also in the contexts of defensive and offensive behavior and regulation of development as well as protection from parasites and pathogens.

Chapter 7 (Nassera Kadiri, Jean-Pierre M. Lumaret and Imelda Martínez-M.) considers the role of dung beetle guilds in ecosystem cycling and maintenance, including competition with other dung-associated groups of organisms. In essence, this chapter is a primer on dung beetle community ecology and ecosystem management with an impressive bibliography of 279 citations. The positive effects of dung beetle activities (“ecosystem services”) are well documented and understood. But, as the authors point out, to the detriment of their important ecological functions, they are not always carefully considered by agriculturists, developers and others responsible for management of land and its natural resources—a topic more fully explored in Chapter 8.

Chapter 8 (Jean-Pierre Lumaret, Nassera Kadiri and Imelda Martínez-M.) is very much a sequel to the previous chapter as it focuses on the increasingly important realization that understanding basic reproductive biology of dung beetles bears directly on long term regulation of induced and native pasture ecosystems and careful husbandry of local and regional dung beetle faunas, especially regarding the use of pesticides and veterinary antiparasitics and other factors that affect the reproductive process. Healthy, diverse dung beetle communities are the hallmark of healthy ecosystems, especially in agricultural and ranching settings, and inappropriate or careless use of herbicides, insecticides, antiparasitics and other livestock medicinals can have devastating effects on dung beetle populations and, consequently, the environmental services they provide. Lamentably, bad cultural practices, combined with the effects of global warming and pollution, have placed dung beetle populations at risk worldwide.

Organized as it is in eight independent contributions, there is the inevitable amount of overlap and duplication in text and bibliography, but this is of minor consequence since most readers will likely be consulting individual chapters of immediate interest. While a global index would have been a useful addition, the table of contents is detailed enough to guide a reader to those parts of immediate interest. Perhaps its only serious liability is that publication costs have precluded a paper edition, which will severely limit its availability on library shelves.

The editors are to be heartily commended for their impressive effort to bring together a tremendous amount of useful information. This book will no doubt take its place as an important reference for the entire multilingual community interested in dung beetle natural history. Best of all, this book is a gift to the community of dung beetle aficionados and can be downloaded gratis at https://www.researchgate.net/publication/368751014_2022_Martinez_M_I_y_Lumaret_J_P_Eds_Escarabajos_del_estiercol_Biologia_reproductiva_y_su_regulacion

W. D. Edmonds, Portland, Oregon

Highlights of Recent Board of Directors meetings

Three meetings involving the ESC Board of Directors occurred in conjunction with the Joint Annual Meeting (JAM) in Saskatoon. The meetings were hybrid meetings with the majority attending in person, but several directors attending by video-link.

The Board of Directors and many Officers of ESC met on Saturday 14 October 2023 to initiate a strategic planning process. The facilitator for this session will provide a report which will be used by the Board in development of a new strategic plan for the Society.

The final meeting of the outgoing ESC Board of Directors (BOD1) took place on Sunday 15 October 2023, with President Chris MacQuarrie chairing. The Board learned that the organization of both JAM 2023 (Saskatoon) and JAM 2024 (Québec City) is proceeding satisfactorily. The Entomological Society of Alberta will be hosting JAM 2025: principal members of the local organizing committee have been identified, and the committee is working on venue selection. Brief updates on JAM 2026 (Entomological Society of Manitoba) and JAM 2027 (Acadian Entomological Society) were received. President MacQuarrie reported on discussions with the Entomological Society of America (ESA) about a joint meeting with ESA in 2028. ESA had solicited proposals from convention centres in four Canadian cities and had selected Montréal as the most suitable location for the meeting. The regional director of la Société d'entomologie du Québec (SEQ) indicated that SEQ was happy to be a co-host of a meeting in Montréal in 2028; this would not overtax the Society as JAM 2024 was in Québec City and would involve different local volunteers. The ESC Board approved a motion to meet with ESA in Montréal in 2028 and ESC representatives will participate with those of SEQ and ESA in a site visit to the city near the end of October. Subject to a satisfactory outcome of that site visit, a memorandum of understanding regarding the meeting will be drawn up between the three societies. Also, the ESC's Annual Meeting Committee will be tasked with revising the schedule of JAMs, as the current schedule has the Entomological Society of Ontario co-hosting JAM 2028. The ESC sub-committee considering the format of future JAMs reported that it had had one meeting and was planning increased activity in the coming year.

The Board approved a process to address the impending end of *The Canadian Entomologist* (TCE) publication contract with Cambridge University Press (CUP). The current contract ends on 31 December 2025, and if it is decided to terminate the arrangement with CUP, written notification must be given by September 2024. A task force will be established with broad representation from those involved in editorial, production, finance and authorship aspects of TCE. The task force is charged with making recommendations to the Board by June 2024. The current contract with ESC's association management company, Strauss event & association management, will end on 31 December 2023. The Board received recommendations that the contract be renewed from a task force established to consider alternatives, and from ESC's Executive Council. Following presentations and a question-and-answer session with the President of Strauss and with ESC's Executive Director (Strauss contact person for ESC), the Board voted to renew the contract for three years.

The Board approved the ESC Financial Statements for 2022–23 and received for information the financial statements for the ESC Scholarship Fund. ESC Treasurer, Bryan Brunet noted that in 2023–23, the Society had a very small excess of revenue over expenditures. Compared with the previous year, expenditures in almost all categories had increased, and the forecast deficit for the year was averted mostly because of a substantial surplus generated by JAM 2022 in Vancouver, and because of continued sales of digital archives of *TCE*—sales that CUP forecasts will soon decline to zero. Treasurer Brunet indicated that the Society's operating margin was 3%, compared with the general view that a financially healthy not-for-profit corporation such as ESC should

have an operating margin of about 25%. However, it was noted that the Society has significant reserves in investments. Treasurer Brunet reported that the process of separating all financial aspects of the ESC and the ESC Scholarship Fund is continuing, and monies previously paid out of ESC funds for scholarships are being refunded by the Scholarship Fund.

The Board approved two recommendations for consideration by members at the Annual Member Meeting two days later. The first recommendation followed an earlier Board decision that emeritus membership should no longer be available without charge. The Board's recommendation was that emeritus members who do not take TCE be charged membership dues at a 75% discounted rate relative to regular membership dues; the recommended discount for emeritus members who subscribe to TCE is 50%. These discounts are similar to those for student membership. The second recommendation concerned the overall membership rate, which is reviewed by the ESC treasurer in each odd-numbered year. The 2023 review followed a period of high inflation and increasing costs to operate the Society, and it is believed that inflation will continue to be relatively high in the next few years. Consequently, Treasurer Brunet proposed that, effective for the 2025 membership year, dues be increased by 14%. Board members were concerned that such an increase for student members sends a bad message about the value ESC places on student members, particularly in light of the long-standing lack of increases in federal government postgraduate scholarships. Consequently, the Board approved that the 14% increase be recommended for all membership categories except students, whose membership rate would stay at 2023 levels.

The Board addressed several issues related to storage of ESC's physical assets, which are kept in a commercial storage locker in Ottawa. The current storage is decrepit and will soon be demolished. After reviewing several facilities, the Physical Assets Committee recommended a modern, climate-controlled facility as being appropriate for ESC's needs. The new facility is more expensive per unit area, and to keep cost increases to a minimum, the Committee has developed a plan for reducing the amount of material stored. The Board approved entering into a contract with the new facility, and the proposed processes for reducing the amount of material to be stored. Among the latter, extra copies of TCE and Memoirs will be offered free through the *Bulletin* and website conditional upon the recipient covering the cost of shipping, and paper copies of documents from the headquarters building that were not considered worthy of digitizing will be offered to the Entomological Society of Ontario/Canada archive at the University of Guelph.

The Board approved recommendations from the Bylaws, Rules, and Regulations Committee for minor changes to the Committee Guidelines and to the Standing Rules. The Board approved a recommendation from the Insect Common Names Committee to expand the scope of approved common names; these were previously restricted to taxa occurring in Canada but will now include species of high regulatory concern to Canada. This change involves modifying a standing rule and a corresponding change to information on the website. Details of the changes to Standing Rules are provided elsewhere in the *Bulletin*.

The Board approved a recommendation of the Fundraising Committee to increase the rates for advertising in the *Bulletin*, effective 2024. The Board also approved the *Bulletin* Editor's proposal for the design of the cover of future issues of the *Bulletin*. Consideration of this issue was necessary because TCE and the *Bulletin* no longer share a cover design.

The Board received two proposals that it generally favoured but chose to defer until more specific proposals could be considered. The first was a proposal from the Editor of the *Canadian Journal of Arthropod Identification* (CJAI) to augment the stipend paid by the Biological Survey of Canada to the technical editor of CJAI. The second proposal was to increase the value of payments to speakers in the Graduate Student Showcase, and to develop a more prestigious title that would signify that speakers in the Showcase they were selected as the best in a competitive process.

The incoming Board Meeting (BOD2) occurred shortly after the Annual Member Meeting on 17 October 2023 with newly installed President Colin Favret chairing. Most of the business at the meeting involved the appointment of officers, signing authorities and committee chairs. A new item on the agenda of this meeting, which President Favret intends to be a regular feature of Board agendas was an opportunity, following approval of the agenda to declare any conflicts of interests. This item is the first outcome of the strategic planning meeting mentioned above. President Favret also sought Board approval for a tentative schedule for development of the strategic plan, with the intent that it be ratified by members at the Annual Member Meeting in October 2024, and implementation processes finalized and ratified at the Annual Member Meeting in 2025.

73rd Annual Meeting of Members Delta Hotels Saskatoon Downtown, Saskatoon, SK 17 October 2023 Minutes

1. Call to Order

ESC President Chris MacQuarrie called the meeting to order at 12:42 PM MDT with about 100 members in attendance.

2. Notice of Meeting

The formal notice of meeting was emailed to all members on 25 September 2023 with a reminder on 5 October. Preliminary notices were published in the March, June and September issues of the *Bulletin*.

3. Additions to and approval of the Agenda

A draft agenda had been emailed to all members on Wednesday 11 October 2023.

Motion: that the agenda be approved as distributed.

Moved by Tyler Wist, **seconded** by Christopher Dufault. **Carried.**

4. Minutes of the 72nd Annual Meeting of Members

ESC Co-Secretary Neil Holliday reported that the minutes of the 72nd Annual Meeting of Members were published in the March 2023 issue of the *Bulletin*, and asked whether there were any errors or omissions.

Motion: that the minutes of the 72nd Annual Meeting of Members be approved as distributed.

Moved by Neil Holliday, **seconded** by Brian van Hezewijk. **Carried.**

5. Commemoration of deceased members of the entomological community

President MacQuarrie reported that the Society had been notified of the deaths of eleven Canadian entomologists since the last Annual Meeting of Members: Gary Anweiler, Edmonton, AB; Don Bright, Ottawa, ON; Milton Campbell, Ottawa, ON; Peggy Dixon, St John's, NL; Richard Freitag, Thunder Bay, ON; Claude Guertin, Laval, QC; Doug Inglis, Lethbridge, AB; Arthur (Bud) McGinnis, Vineland, ON (2019); Freeman McEwen, Guelph, ON; Lisa Poirier, Prince George, BC; and Geoff Scudder, Vancouver, BC. A moment of silence was observed in memory of these deceased entomologists.

6. Report from the Board of Directors

President MacQuarrie presented the report on behalf of the Board. The Board and ESC Officers had participated in a strategic review session on 14 October 2023, and members should

expect to hear more about the strategic planning process during the coming year. At its meeting of 15 October 2023, the Board had approved renewal of its contract for management services with Strauss event & association management. At the same meeting, the Board had approved in principle a plan to meet jointly with the Entomological Society of America and la Société d'entomologie du Québec in Montreal in 2028. The Board had approved donations to EntoPOC, an organization that provides memberships in entomological societies for people of colour, and FREED (Field Research in Ecology and Evolution Diversified), which provides field research experience, community building, and career mentorship for indigenous, black, and/or racialized students. During the year, President MacQuarrie held four virtual open houses with members from across Canada and around the world.

President MacQuarrie briefly reviewed the number of members in each category of membership, noting that total membership was about 500, and that the option of autorenewal of membership had been extended to all membership categories. He commended and thanked the organizing committee for the 2023 Joint Annual Meeting (JAM) and urged members to attend JAM 2024 from 20–24 October 2024 in Québec City, and he provided information on the co-hosts for JAMs from 2025 to 2028.

Membership Category	Current Members				
	2019	2020	2021	2022	2023
Early Professional	36	20	22	52	41 (2*)
Emeritus	71 (2*)	73 (3*)	78 (4*)	69 (5*)	71 (6*)
Honorary Member	5	5	5	8	7
Regular	252 (66*)	215 (69*)	226 (77*)	240 (84*)	205 (85*)
Student	169	95	107	140	137
Enthusiast	—	24	44	38	35 (1*)
Grand Total	532 (68*)	431 (72*)	482 (81*)	547 (89*)	496 (94*)

* Members using auto-renewal

7. Resolution to approve the actions of the Board

Motion: that all by-laws, contracts, acts and proceedings of the Board of Directors of the ESC enacted, made, done or taken since 15 November 2022, being the date of the last Annual Meeting of Members, be approved, adopted, ratified, sanctioned and confirmed.

Moved by Chris MacQuarrie, **Seconded by** Matthew Muzzatti. **Carried.**

8. Treasurer’s Report

ESC Treasurer Bryan Brunet presented the report. After the financial statements were posted to the website to meet the requirement that membership have access 21 days before the Annual Member Meeting, it was discovered that incorrect information had been used by the auditor. So, both the original report, and an amended report using the correct information were posted on the website.

The Society posted a surplus of about \$4,400. Total revenue was about \$136,000 of which the main components were a surplus from JAM 2022, profits from *The Canadian Entomologist*, and membership dues; the latter two components changed little from the previous year. Total expenditures were about \$132,000, with increases in costs in almost every category. Treasurer Brunet noted that the Board had reviewed and approved the 2022–2023 financial statements of ESC.

Motion: that the 2022-2023 financial statements for the Entomological Society of Canada be approved.

Moved by Christopher Dufault, **Seconded by** Chris MacQuarrie. **Carried.**

Treasurer Brunet introduced the financial statements for the scholarship fund, which are for information only. Total scholarships paid increased to \$18,000 in the 2022–2023 financial year,

and over \$10,000 was received in donations. The fund continued its program of payments to ESC in reimbursement of past ESC payments of scholarships on behalf of the fund. Future payments of scholarships will be directly from the scholarship fund, as Canada Revenue Agency rules for the scholarship fund, which is a registered charity, require complete financial separation from ESC.

Motion: that the members receive for information the 2022–2023 financial statements of the Entomological Society of Canada Scholarship Fund.

Moved by Bryan Brunet, **Seconded** by Julie Soroka. **Carried.**

9. Appointment of public accountants

Motion: that Bouris, Wilson LLP of Ottawa be appointed as public accountants to the ESC to conduct the review engagement of the financial statements for the 2023-2024 financial year.

Moved by Chris MacQuarrie, **Seconded** by Brian van Hezewijk. **Carried.**

10. Motion to charge dues to Emeritus Members

President MacQuarrie stated that over the last year, the Board had been considering whether Emeritus Members should be charged dues. The Emeritus Membership category was introduced in 1975 and it was determined that such members would not pay membership dues unless they wished to receive the Canadian Entomologist. In 1975, 81% of ESC members paid regular membership rates and there were 35 Emeritus members, 4% of the total. In 2023, only 41% of the membership pay regular membership rates and 14% of members are Emeritus. He called upon Treasurer Brunet to present the motion, which the Board recommends be approved by the members.

Motion: that beginning in the 2025 membership year, Emeritus Members of the ESC pay dues at a 75% discounted rate without TCE access or pay dues at a 50% discounted rate with TCE access.

Moved by Bryan Brunet, **Seconded** by Bob Lamb. **Carried.**

11. Motion regarding increase in membership dues

President MacQuarrie pointed out that the membership dues increase that is about to be presented, is recommended by the ESC Board of Directors. He noted that the increase is a response to the high levels of inflation that are currently being experienced. Treasurer Brunet presented the motion and displayed a table of the current and proposed dues.

Membership category	Current rate (\$)	Proposed rate (\$)
Student with TCE	59.50	59.50
Student without TCE	30.00	30.00
Entomology Enthusiast	59.50	68.00
Early Professional	90.00	102.00
Emeritus with TCE	79.50	68.00
Emeritus without TCE	0.00	34.00
Regular	119.25	136.00

Motion: that membership rates increase by approximately 14%, effective for the 2025 membership year but that the rates for students remain at 2023 levels.

Moved by Christopher Dufault, **Seconded** by Meghan Vankovsky.

Discussion: In response to a question from Christopher Dufault, Treasurer Brunet indicated that an increase in rates had last been approved two years ago (2021) and had come into effect in 2023. President MacQuarrie explained that students were excepted from increases because NSERC scholarships have not increased for many years.

The motion was **carried**.

12. Election of Directors

Co-Secretary Holliday presented the slate of candidates for election as directors.

Motion: that the following candidates be elected as Directors.

Moved by Neil Holliday, **Seconded by** Matthew Muzzatti.

Position	Candidate	Term
Societal Director (2 nd Vice-President)	Rob Johns, CFS, Fredericton, NB	3 years
Director at large	Leah Flaherty, MacEwan University, Edmonton, AB	3 years
Director for Equity, Diversity and Inclusion	Catherine Scott, McGill University, Montreal, QC	3 years
Regional Director, ESS	Danielle Stephens, Regina, SK	3 years
Regional Director, ESM	John Gavloski, Manitoba Agriculture, Carman, MB	3 years

Discussion: Co-Secretary Holliday noted that under Canada’s Not-for-Profit legislation all candidates must either be present at the election in person or have signified in writing that they are willing to serve. The Co-Secretaries have received written statements of willingness from Rob Johns and John Gavloski, who were not present at the election.

The motion was **Carried**.

13. Transfer of Office

President MacQuarrie presented the gavel to incoming President Colin Favret.

Retiring past president Felix Sperling stated that if Rob Johns had been here in person, he would have been escorted to the head table by Felix. In the absence of Rob Johns, Felix carried an effigy representing the new 2nd Vice-President to the head table.

President Favret took over chairing of the meeting.

14. Presentation of Service Awards

President Favret paid tribute to the work of outgoing President MacQuarrie and of retiring Co-Secretary Holliday. He presented ESC service awards to each of them.

15. Resolution of thanks

President Favret called upon Director at large Jessica Gillung to deliver the resolution of thanks:

Whereas the Entomological Society of Canada has met jointly with the Entomological Society of Saskatchewan at the Delta Hotels Saskatoon Downtown, Saskatoon, SK; and Whereas there has been a full and interesting meeting of lectures, symposia, papers, and posters; and

Whereas the meeting has been planned with care and concern for those attending; and

Whereas there has been ample opportunity for social interaction and visits to Saskatoon and surrounding areas

Be it resolved that the Entomological Society of Canada expresses its sincere thanks to the conference planning committee for their hard work and skill in arranging a worthwhile and entertaining program; and

Be it further resolved that the Society express its thanks to the sponsors that generously donated funds to support activities at the meeting and travel for some students to attend the meeting; and

Be it further resolved that the Society expresses its thanks to the Management and Staff of the Delta Hotels Saskatoon Downtown for their courteous assistance during the Meeting.

The resolution was approved by a round of applause.

16. Notice of 74th Annual Meeting of Members

The 74th Annual Meeting of Members is expected to be held on Tuesday, 22 October 2024 in the Hôtel Le Concorde, 1225 Cours du Général-de Montcalm, Québec City, QC.

17. Adjournment

Motion: to adjourn.

Moved by Tyler Wist, **Seconded** by Georgiana Antochi-Crihan. **Carried.**

President Favret declared the meeting adjourned at 1:11 PM MDT.

Outgoing Board members.

Front row (kneeling), from left: Jessica Gillung, Bernie Roitberg, Felix Sperling, Christine Noronha, Danielle Stephens, Chris MacQuarrie.

Back rows, from left: Dezene Huber, Kyle Bobiwash, Rose Labbé, Maya Evenden, Leah Flaherty, Neil Holliday, Bryan Brunet, Heather Proctor, Brian Van Hezewijk, Suzie Blatt, Amanda Roe, Matt Muzzatti, Morgan Jackson, Catherine Scott, Colin Favret.



T. Wist



T. Wist

Annual Meeting of Members

From left: Neil Holliday, Bryan Brunet, Felix Sperling, Christine Noronha, Colin Favret, Chris MacQuarrie



T. Wist

Official passing of the gavel from outgoing President Chris MacQuarrie to new President Colin Favret.

Announcement of Change to the ESC Standing Rules

At its meeting of the Board of Directors of ESC approved several changes to the Standing Rules. Below the approved deletions are shown with ~~strike out~~ and additions are underlined.

The Board approved changes to update the responsibility for providing advice to the webmaster on matters of website policy and design. These changes are necessary because the subcommittee that previously had the responsibility no longer exists.

In Standing Rule VII (l) Webmaster, section i) is amended by the following substitution:

- i) The Webmaster, although responsible to the Board, will normally consult with the ~~Public Education Committee (specifically the E-media sub-committee)~~ Communications Committee on policies relating to the web site and its design, and with the Finance Committee on matters relating to expenditures and financing.

In Standing Rule IX 2), section (e) Communication Committee is amended by the following additional duty:

- (e) Communications Committee

The Communications Committee shall be responsible for the social media platforms and blog of the Entomological Society of Canada. The Committee shall receive, edit, post, and remove material consistent with the objects of the Corporation. When required, the Committee shall be responsible for advising the Webmaster on policies relating to the web site and its design.

The Board approved changes to remove references that became obsolete when digital copies of articles in *The Canadian Entomologist* could be purchased, and back issues and reprints were no longer provided.

In Standing Rule XVII Publications, item 4) is amended by a substitution and item 5) is deleted:

- 4) The cost of reprints articles from *The Canadian Entomologist* will be set by the Publisher.
- ~~5) The price of back issues of *The Canadian Entomologist* shall be determined by the Treasurer.~~

The Board approved changes in the Standing Rule governing the criteria for inclusion in the ESC's Insect Common Names list. In November 2021, in response to submissions to establish common names of organisms in countries far distant from Canada, the Board had approved a restriction that only taxa occurring in Canada should be listed. However, this excluded taxa that are of regulatory concern to Canadian agencies, but do not currently occur in the country. The ESC's Insect Common Names Committee requested the inclusion of such taxa, as this would facilitate invasive species initiatives of the Canadian Food Inspection Agency and Natural Resources Canada.

In Standing Rule IX 2), section (j) Insect Common Names Committee is amended by the following additions:

The Committee shall maintain a list of English and French names of insects and related arthropods in Canada. Lists shall be restricted to taxa that have been identified as of high regulatory concern to Canada or taxa that occur in Canada for which there are clear benefits to having names that are accessible to the general public: examples are taxa for which

there are monitoring programs at ports, economically relevant taxa, threatened species, and taxa, such as butterflies and dragonflies, that are easily distinguishable without specialized knowledge or equipment. The committee shall receive proposals and assist in their preparation. It shall inform the Chair of the Committee on Common Names of Insects of the Entomological Society of America of English names it has approved. The Entomological Society of Quebec shall be consulted regarding proposals for French common names. The Committee shall do all it can to ensure proper usage of common names of insects and related arthropods in Canada.

Avis sur les changements apportés aux Règles permanentes de la SEC

Lors de sa réunion, le CA de la SEC a approuvé plusieurs modifications des Règles permanentes. Les suppressions approuvées sont indiquées ci-dessous par une **biffure** et les ajouts sont soulignés.

Le CA a approuvé les changements visant à actualiser la responsabilité de conseiller le webmestre sur les questions de politique et de conception du site web. Ces changements sont nécessaires car le sous-comité qui assumait *précédemment cette responsabilité n'existe plus*.

Dans l'article VII (I) des Règles permanentes, la section i) du webmestre est modifiée par la substitution suivante :

i) La personne webmestre, bien qu'il relève du CA, doit normalement consulter le comité d'éducation ~~(particulièrement le sous-comité des médias électroniques)~~ des communications sur les politiques concernant le site web et son design, et avec le comité des finances sur les questions relatives aux dépenses et aux finances.

À l'article IX 2) du règlement, la section c.-à-d. Comité des communications est modifiée par l'ajout de la tâche suivante :

(e) Comité des communications

Le comité des communications est responsable des plateformes de médias sociaux et du blogue de la Société d'entomologie du Canada. Le comité recevra, éditera, affichera et retirera le matériel conforme aux objectifs de l'Organisation. Le cas échéant, le comité est chargé de conseiller le ou la webmestre sur les politiques relatives au site web et à sa conception.

Le CA a approuvé des modifications visant à supprimer des références devenues obsolètes depuis qu'il est possible d'acheter des copies numériques d'articles dans The Canadian Entomologist et que les anciens numéros et les réimpressions ne sont plus fournis.

À l'article XVII Publications, le point 4) est modifié par une substitution et le point 5) est supprimé :

4) Le coût des ~~tirés à part~~ articles de la revue The Canadian Entomologist sera déterminé par la maison d'édition.

5) ~~Le coût des anciens numéros de The Canadian Entomologist est déterminé par la trésorerie.~~

Le CA a approuvé les modifications apportées à la Règles permanentes régissant les critères d'inscription sur la liste des noms communs d'insectes de la SEC. En novembre 2021, en réponse à des soumissions visant à établir des noms communs d'organismes dans des pays très éloignés du Canada, le CA avait approuvé une restriction selon laquelle seuls les taxons présents au Canada devaient être répertoriés. Cette restriction excluait toutefois les taxons qui présentent un intérêt réglementaire pour les organismes canadiens, mais qui ne sont pas encore présents dans le pays. Le comité des noms communs d'insectes de la SEC a demandé l'inclusion de ces taxons, car cela faciliterait les initiatives de l'Agence canadienne d'inspection des aliments et de Ressources naturelles Canada en matière d'espèces envahissantes.

À l'article IX 2) du règlement, la section (j) Comité des noms communs d'insectes est modifiée par les ajouts suivants :

Le comité doit maintenir à jour une liste des noms communs d'insectes et autres arthropodes apparentés du Canada en anglais et en français. Les listes doivent être limitées aux taxons identifiés comme présentant un risque réglementaire élevé pour le Canada ou présents au Canada pour lesquels il y a des avantages clairs à avoir des noms qui sont accessibles au grand public : par exemple, des taxons pour lesquels il existe des programmes de surveillance dans les ports, des taxons d'importance économique, des espèces menacées, et des taxons, tels que les papillons et les libellules, qui sont facile à distinguer sans connaissances ou équipement spécialisés. Le comité doit recevoir les propositions et peut assister dans leur préparation. Il doit informer la présidence du comité des noms communs de la Société d'entomologie d'Amérique des noms anglais qu'il a approuvés. La Société d'entomologie du Québec doit être consultée concernant les propositions de noms communs en français.

Le comité doit faire tout ce qui est en son pouvoir pour assurer un usage approprié des noms communs d'insectes et d'arthropodes apparentés au Canada.



Executive Meeting - Call for Agenda Items

If members have any items they wish to be discussed at the next Board of Directors or Executive Council meeting, please send them to the Co-Secretaries (see inside back cover for contact details), as soon as possible.

Réunion du conseil exécutif – Points à l'ordre du jour

Si des membres aimeraient ajouter des points à l'ordre du jour pour discussion à la prochaine réunion du Bureau des directeurs ou du Conseil de l'exécutif, merci de les envoyer aux cosecrétaires (voir le troisième de couverture pour les informations de contact), le plus tôt.

Call for nominations: Societal Director, Director at Large

The Society will hold an online ballot to select candidates for a Societal Director and Director at Large. The selected candidates will then be presented as a slate for formal election by members at the Annual Meeting in Quebec City in October. Nominations for these positions must be signed by three active members of the Society and be received by a Co-Secretary of the Entomological Society of Canada, by 30 March 2024 (see inside back cover for contact details).

Appel à candidatures : de direction sociétale, de conseiller ou conseillère

La Société tiendra un vote en ligne afin de sélectionner des candidatures pour les postes de direction sociétale et de conseiller ou conseillère. Les candidatures sélectionnées seront ensuite présentées à la réunion annuelle à Québec en octobre pour une élection formelle par les membres. Les nominations pour ces postes doivent être signées par trois membres actifs de la Société et être reçues par un ou une co-secrétaire de la Société d'entomologie du Canada au plus tard le 30 mars 2024 (voir le troisième de couverture pour les informations de contact).

Members' discounts

Entomological Society of Canada members can enjoy discounts on publications from Annual Reviews, Elsevier, Cambridge University Press, and the Entomological Society of America. Details of how to benefit from these discounts are available on the member's area of the Entomological Society of Canada website at: <https://esc-sec.site-ym.com/>.

Remise pour les membres

Les membres de la Société d'entomologie du Canada peuvent bénéficier d'une remise lors d'achats de publications de : Annual Reviews, Elsevier, Cambridge University Press et de la Société d'entomologie d'Amérique. Les informations nécessaires pour profiter de ces remises sont disponibles dans la section des membres du site de la Société d'entomologie du Canada à : <https://esc-sec.site-ym.com/>.

Call for Nominees: ESC Achievement Awards / Appel à candidature: 2023 Prix d'excellence de la SEC

Do you know a well-respected entomologist who deserves recognition because of their outstanding contributions to their science in Canada? Is this person a leader in their field due to successes in publishing, patenting, editorial work and/or grantsmanship, in the teaching and mentoring of students, or through active volunteer involvement in the ESC and other societies/organizations? If yes, consider nominating them for one of our Society's Achievement Awards. Do not hesitate to contact the Chair of the Achievement Awards Committee, Christine Noronha (christine.noronha@agr.gc.ca), if you have any eligibility or nomination process questions.

Applications are to be sent by e-mail to the Chair of the Achievement Awards Committee, Christine Noronha (christine.noronha@agr.gc.ca), no later than **29 February 2024**. Award-specific nomination guidelines can be found below.

Connaissez-vous un entomologiste respecté qui mérite une reconnaissance pour ses contributions remarquables dans son domaine au Canada? Cette personne est-elle un leader dans son domaine par son succès en publications, brevets, travail éditorial et/ou subventions, enseignement et mentorat d'étudiants, ou même par du bénévolat actif dans la SEC et d'autres sociétés/organisations? Si oui, considérez de la nommer pour un de nos prix d'excellence de la Société. N'hésitez pas à contacter la président du comité des prix d'excellence, Christine Noronha (christine.noronha@agr.gc.ca), si vous avez des questions concernant l'éligibilité ou le processus de nomination.

Les candidatures doivent être envoyées soit par courriel au président du comité des prix d'excellence, Christine Noronha (christine.noronha@agr.gc.ca), au plus tard le **29 février 2024**.

Gold Medal and C. Gordon Hewitt Awards Médaille d'or et prix C. Gordon Hewitt

Both awards are for outstanding entomological contributions in Canada by an individual. The C. Gordon Hewitt Award nominee must have successfully defended their doctoral thesis in the 12 years ending on 31 December of the year in which the Award is received.

Nominations can only be made by members of the ESC, and signed by the nominator and by at least one seconder (also to be a member of the ESC). Nominators should include the following information for both awards: 1. The name and address of the nominee(s); 2. A statement of relevant achievements (3-5 pages) which may include but is not limited to, the following: outline of research areas, particularly major contributions; numbers of articles in refereed journals, books, book chapters, patents; editorial activities; teaching history, numbers of graduate students, teaching

Ces deux prix vont pour les contributions remarquables en entomologie au Canada par un individu. Le candidat/la candidate au prix C. Gordon Hewitt doit avoir défendu avec succès sa thèse de doctorat au cours des 12 dernières années se terminant le 31 décembre de l'année au cours de laquelle le prix est reçu.

Les nominations ne peuvent être faites que par des membres de la SEC, et doivent être signées par la personne qui soumet la nomination et par au moins un personne qui appui la nomination (qui doit aussi être membre de la SEC). Les personnes qui soumettent la nomination doivent inclure les informations suivantes pour les deux prix : 1. Le nom et l'adresse du nominé ; 2. Un énoncé sur les accomplissements pertinents (3-5 pages) qui peut inclure, mais ne se limite pas à : domaine de recherche, contributions majeures particulières, nombre d'articles dans des revues avec évaluation, livres, chapitres de livres,

awards; value of grants; involvement in ESC; active involvement and/or memberships in other Societies; entomological extension/community involvement; organizing of symposia, meetings; 3. A current curriculum vitae; and 4. The name of the nominator and at least one seconder. The documentation should stress the particular achievement or achievements to be considered and not merely the general competences of the nominee. Other seconders may merely state their support, without documentation, in a letter of endorsement of the nomination. The Committee shall not prepare the documentation nor conduct research connected with it. Please send nominations by e-mail to the Chair of the Achievement Awards Committee, Christine Noronha (christine.noronha@agr.gc.ca), no later than **29 February 2024**.

brevets, activités éditoriales, histoire d'enseignement, nombre d'étudiants gradués, prix d'enseignement, valeur des subventions, implication dans la SEC, implication active et/ou adhésion à d'autres sociétés, implication dans la communauté entomologique, organisation de symposiums et réunions ; 3. Un curriculum vitae à jour ; et 4. Le nom de la personne qui soumet la nomination et au moins une personne qui l'appuie.

La documentation devrait mettre en évidence le ou les accomplissements particuliers à considérer et pas seulement les compétences générales du nommé. D'autres personnes peuvent aussi manifester leur appui, sans documentation, dans une lettre de soutien de la nomination. Le comité ne préparera aucune documentation et ne fera aucune recherche en lien avec la nomination.

Merci d'envoyer vos nominations par courriel au président des prix d'excellence, Christine Noronha (christine.noronha@agr.gc.ca), au plus tard le **29 février 2024**.

Honorary Members of the Entomological Society of Canada Membres honoraires de la Société d'entomologie

An Honorary Member is deemed to have made an outstanding contribution to the advancement of entomology, and may be an Active Member or former Active Member of the Society at the time of nomination.

Collectively, Honorary Members are not to comprise more than 10 members or 1% of the active membership of the Society. Nominations should be supported by at least five Active or Special Members of the Society, and are to be sent by e-mail to the Chair of the Achievement Awards Committee Christine Noronha (christine.noronha@agr.gc.ca), no later than **29 February 2024**.

Un membre honoraire est considéré comme ayant apporté des contributions remarquables à l'avancement de l'entomologie et peut être un membre actif ou un ancien membre actif de la Société au moment de la nomination.

Collectivement, les membres honoraires ne peuvent pas totaliser plus de 10 membres ou 1% des membres actifs de la Société. Les nominations doivent être supportées par au moins cinq membres actifs ou spéciaux de la Société, et doivent être envoyées par courriel au président des prix d'excellence, Christine Noronha (christine.noronha@agr.gc.ca), au plus tard le **29 février 2024**.

Fellows of the Entomological Society of Canada Membres associés de la Société d'entomologie du Canada

Fellows are deemed to have made a major contribution to entomology, and are to be Active Members of the Society at the time of nomination. Their contribution may be in any area (e.g., research, teaching, application or administration), and may be judged on the basis of contribution to and stimulation of the work of others, as well as by direct personal effort.

Collectively, Fellows may not comprise more than 10% of the active membership of the Society. Nominations should be supported by at least four Active or Special Members of the Society, and are to be sent by e-mail to the Chair of the Achievement Awards Committee Christine Noronha (christine.noronha@agr.gc.ca), no later than **29 February 2024**.

Les associés sont considérés comme ayant apporté une contribution majeure à l'entomologie et doivent être des membres actifs de la Société au moment de la nomination. Leur contribution peut se situer dans n'importe quel domaine (e.g. recherche, enseignement, application ou administration), et ils seront jugés selon leur contribution et la stimulation au travail des autres, ainsi que par leurs efforts personnels.

Collectivement, les *associés* ne peuvent pas totaliser plus de 10% des membres actifs de la Société. Les nominations doivent être supportées par au moins quatre membres actifs ou spéciaux de la Société et doivent être envoyées par courriel au président des prix d'excellence, Christine Noronha (christine.noronha@agr.gc.ca), au plus tard le **29 février 2024**.

Wanted: Applicants for the Bert and John Carr Award Recherchés : Candidats pour le prix Bert & John Carr

The Bert and John Carr Award was created in 2010 (see ESC Bulletin, June 2010 [p. 102] or September 2010 [p. 170]) to support research activities by individuals who study insect faunistics, or the natural history and taxonomy of Canada's insect fauna. Preference is given to applications by amateurs, but those by students and others will be considered.

Applications should consist of: 1. The name and address of the applicant; 2. A statement of the research activity to be undertaken, including a cost estimate of up to \$1000; and 3. A current curriculum vitae. Applications are to be sent by e-mail to the Chair of the Achievement Awards Committee Christine Noronha (christine.noronha@agr.gc.ca), no later than **29 February 2024**.

Le prix Bert et John Carr a été créé en 2010 (voir le Bulletin de la SEC, juin 2010 [p.102] ou septembre 2010 [p.170]) pour en appui à des activités de recherche menées par des individus qui étudient la faune entomologique ou l'histoire naturelle et la taxonomie de la faune entomologique du Canada. Une préférence sera donnée aux candidatures provenant d'amateurs, mais des candidatures présentées par des étudiants ou d'autres individus seront aussi prises en considération.

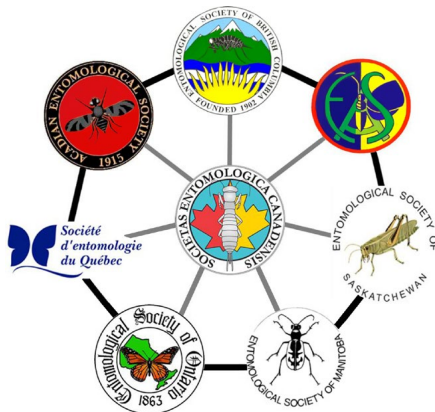
Les candidatures devront inclure : 1. Le nom et l'adresse du candidat; 2. Un énoncé sur les activités de recherche devant être entreprises par le candidat, dont une estimation des coûts jusqu'à concurrence de 1000 \$; et 3. Un curriculum vitae à jour. Les candidatures doivent être envoyées par courriel au président du comité des prix d'excellence Christine Noronha (christine.noronha@agr.gc.ca), au plus tard le **29 février 2024**.

ESC Co-Secretary

The Entomological Society of Canada is looking for a member willing to serve in the position of Co-Secretary. The ESC's two Co-Secretaries share the secretarial duties in support of the President and Board of Directors by:

- Scheduling meetings of the Executive Council, Board, and the Members, preparing agendas, obtaining reports from Officers and others, sending out notices of meetings, attending the meetings, and recording minutes.
- Working with our Association Management Company (Strauss event & association management) to ensure that records of Society activities such as agendas, minutes, reports, and correspondence are preserved, and to prepare the Society's annual filings with Corporations Canada and other government agencies.
- Providing information on Society business to the Bulletin Editor, Webmaster, and Strauss for publication, posting, and circulation to the membership as necessary.
- Maintaining up-to-date lists and contact information for the Society's Board and Committees.
- Overseeing plebiscites to recommend candidates for nominations as Societal Director and Director-at-Large, and for any other questions on which votes may be required, and notifying of the results of voting. Advising affiliated societies when they need to provide names for nominations as Regional Directors.

A familiarity with the Society's by-laws, rules, and guidelines, past experience as a Board member, and the ability to work in French and English would all be assets. This is a great opportunity to serve one of the oldest biological societies in North America and to deepen your contacts with the Canadian entomological community. Any member interested in serving in this position may contact Erin Campbell (Erin.Campbell@inspection.gc.ca) for further information. Applications should be made to the President, Colin Favret (ESCPresident@esc-sec.ca). The final selection will be made by an ad hoc committee convened by the President.



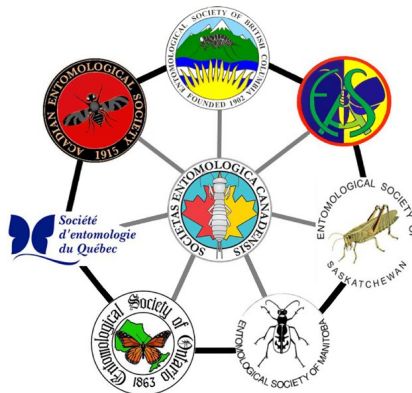
Cosecrétaire

La Société d'entomologie du Canada est à la recherche d'une personne membre souhaitant occuper le poste de cosecrétaire. Les deux cosecrétaires de la SEC se partagent les tâches de secrétariat en soutien à la présidence et au CA de la SEC :

Planifier les réunions du Conseil exécutif, du CA et des membres, préparer les ordres du jour, obtenir les rapports des dirigeants et dirigeantes et d'autres personnes, envoyer les avis de convocation, assister aux réunions et rédiger les procès-verbaux.

- Travailler avec notre société de gestion d'association (Strauss event & association management) pour s'assurer que les documents relatifs aux activités de la Société, tels que les ordres du jour, les procès-verbaux, les rapports et la correspondance, sont conservés et pour préparer les déclarations annuelles de la Société auprès de Corporations Canada et d'autres agences gouvernementales.
- Fournir des informations sur les activités de la Société au rédacteur du bulletin, au webmestre et à Strauss pour qu'ils les publient, les affichent et les fassent circuler parmi les membres si nécessaire.
- Maintenir à jour les listes et les coordonnées du CA et des comités de la Société.
- Superviser les plébiscites visant à recommander des candidatures pour les postes d'administration de la Société et de conseiller ou conseillère, ainsi que pour toute autre question nécessitant un vote, et notifier des résultats du vote. Conseiller les sociétés affiliées lorsqu'elles doivent fournir des noms pour les nominations aux postes d'administration régionale.

Une bonne connaissance des règlements, des règles et des lignes directrices de la Société, une expérience passée en tant que membre du CA et la capacité de travailler en français et en anglais sont autant d'atouts. Il s'agit d'une excellente occasion de servir l'une des plus anciennes sociétés biologiques d'Amérique du Nord et d'approfondir vos contacts avec la communauté entomologique canadienne. Toute personne membre intéressée par ce poste peut contacter Erin Campbell (Erin.Campbell@inspection.gc.ca) pour de plus amples informations. Les candidatures doivent être adressées au président, Colin Favret (ESCPresident@esc-sec.ca). La sélection finale sera effectuée par un comité ad hoc convoqué par le président.



Seeking a new Assistant (technical) editor: *Bulletin of the Entomological Society of Canada*

The Assistant Editor works closely with the Editor to produce four quarterly editions of *The Bulletin of the Entomological Society of Canada*, in March, June, September, and December. Generally, the Assistant Editor's work involves laying out each issue of the *Bulletin* using the edited material provided by the Editor. The time commitment can range from about 25 to >40 hours of work for each issue, depending on the amount and complexity of material.

Duties include formatting the annual cover for the *Bulletin*, using photos provided by the photo contest committee; formatting and preparing the edited material received from the Editor in Chief for publication; laying out the edited material from the Editor in Adobe InDesign desktop publishing software (provided), following instructions from the Editor; distributing the proof copy to contributors to proof their contributions, and making necessary corrections; arranging to have the corrected copy uploaded to the website; arranging to have an eblast message sent to members of the Society to notify them that the *Bulletin* has been uploaded to the website; clipping articles from the *Bulletin* to distribute e-prints to contributors; clipping book reviews from the *Bulletin* to send to the Chair of the Publication Committee; and clipping In-Memory pieces from the *Bulletin* to send to the Webmaster for posting on the Obituaries page of the website.

The applicant should be familiar with and have access to a current version of Microsoft Word. Experience with Adobe InDesign is an asset, but training can be provided.

Interested parties should contact the Publications Committee Chair, Véronique Martel (veronique.martel@NRCan-RNCAN.gc.ca), the current Assistant Editor, Donna Giberson (giberson@upei.ca) or the Editor, Bernie Roitberg (roitberg@sfu.ca) for further discussion.

À la recherche d'une personne pour la rédaction adjointe (technique) : *Bulletin de la Société d'entomologie du Canada*

La rédaction adjointe travaille en étroite collaboration avec la rédaction pour produire quatre éditions trimestrielles du *Bulletin de la Société entomologique du Canada*, en mars, juin, septembre et décembre. En règle générale, le travail de cette personne consiste à mettre en page chaque numéro du *Bulletin* en utilisant le matériel édité fourni par la rédaction. Le temps consacré à chaque numéro peut aller de 25 à plus de 40 heures de travail, en fonction de la quantité et de la complexité du matériel.

Les tâches incluent mettre en forme la couverture annuelle du *Bulletin*, en utilisant les photos fournies par le comité du concours photo; mettre en forme et préparer le matériel édité reçu de la rédaction en chef pour la publication, mettre en page le matériel édité par la rédaction en chef dans le logiciel de publication assistée par ordinateur Adobe InDesign (fourni), en suivant les instructions de la rédaction; distribuer les épreuves d'impression aux contributeurs et contributrices pour qu'ils vérifient leurs contributions et apportent les corrections nécessaires; faire en sorte que la copie corrigée soit téléversée sur le site web; organiser l'envoi d'un message électronique aux membres de l'association pour les informer que le *Bulletin* a été téléversé sur le site web; prélever des articles dans le *Bulletin* pour distribuer aux contributeurs; prélever les critiques de livres dans le *Bulletin* pour les envoyer à la présidence du comité des publications et prélever les articles « En mémoire » du *Bulletin* pour les envoyer au webmaster afin qu'ils soient publiés sur la page « Notices nécrologiques des membres » du site web.

La personne qui postule doit être familiarisée avec Microsoft Word et avoir accès à une version récente de ce logiciel. Une expérience avec Adobe InDesign est un atout, mais une formation peut être dispensée.

Les personnes intéressées peuvent contacter la présidente du comité des publications, Véronique Martel (veronique.martel@NRCan-RNCAN.gc.ca), l'actuelle rédactrice adjointe, Donna Giberson (giberson@upei.ca) ou le rédacteur, Bernie Roitberg (roitberg@sfu.ca) pour de plus amples informations.

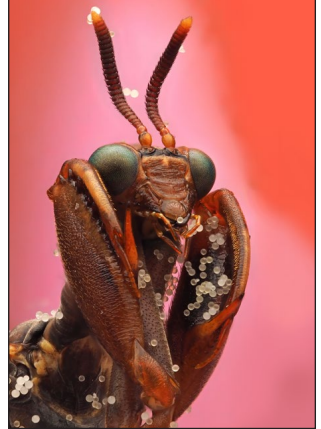
Winners of the 2023 Entomological Society of Canada Photo Contest / Gagnants du concours de photographie 2023 de la Société d'entomologie du Canada

The photo contest this year saw 42 images submitted, by 11 talented photographers. The images this year represented a wide range of species, and many showed extremely interesting behaviours. As with last year's photo contest, the judging was left up to the ESC membership, who kindly took the time to vote on their favourite images. And so, without further ado, here are the winners of the 2023 ESC Photo Contest!

First Place

Thilina Hettiarachchi, with a photo entitled "Mantidfly".

Caption: The charismatic Brown Wasp Mantidfly (*Climaciella brunnea*). This incredible creature actually mimics the appearance of paper wasps (*Polistes* sp.). Take a moment to admire its exquisite beauty and guess what those white balls on the body are. Winnipeg, Manitoba



Second Place

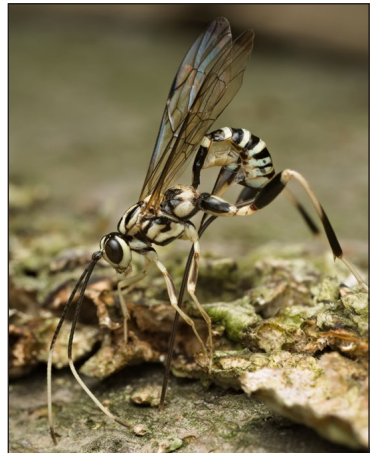
Robert Lalonde, with a photo entitled "Male Walnut Huskflies "boxing" for a territory"

Caption: Two very confused male huskflies (*Rhagoletis completa*) battle it out for a territory, not on a walnut, but on a peach, Kelowna, BC.

Third Place

Jeong Jae Yoo, with a photo entitled "Arotes"

Caption: "*Arotes amoenus* about to drill its ovipositor into wood. Ontario, Canada"



ESC would like to thank all participants in this year's photo contest, and all the members who took time to vote on their favourites.



Did you know?

A special collection of articles related to the theme of 'Diversity through Communities' was created using publications from The Canadian Entomologist (TCE). You can find the collection at the link below

<https://www.cambridge.org/core/journals/canadian-entomologist/collections/a-celebration-of-canada-s-diversity-through-communities>.

Le saviez-vous?

Une collection spéciale d'articles liés au thème << La diversité à travers les communautés >> a été créé à partir des publications dans *The Entomologiste canadien* (TCE).

Vous pouvez retrouver la collection sur le lien ci-dessus



TCE is Seeking submissions!

Submissions will be reviewed and published as they are received, then included in the Special Collection.

'Building Together: Indigenous leadership in entomology' will be a Special Collection in The Canadian Entomologist. Once rolled out, additional submissions will be added as they are received and published.

We seek submissions that include **Indigenous knowledge sharing, co-creation and/or collaboration** between Indigenous Peoples and Alloctones covering all areas of entomology.

<< Bâtir ensemble: Leadership autochtone en entomologie >> sera une collection spéciale de *The Canadian Entomologist*. Suite à la création, des soumissions supplémentaires seront ajoutées au fur et à mesure de leur réception et de leur publication.

Les articles doivent viser le **partage du savoir autochtone, la co-création et/ou la collaboration** entre les peuples autochtones et les non-Autochtones dans toutes les disciplines liées à l'entomologie.

Toqitasik: L'nu'k ikana'tu'tij wjit ula entomology (Mi'kmaq)

Ka-mawmawi oushstawk: indigene neekawneewin daw entomology (Michif Cree)

Oko-ozhitooyang: Niigaanishinaabewanokiwiin gaye inwewin (Western Ojibway)

Agiklitiqniqanik havaqatigiikniqmit: Nunaqaqaqtut Hivuliquhniqit kumaliqijutinuan (Inuinnaqtun)



Les soumissions seront examinées et publiées au fur et à mesure de leur réception, puis incluses dans la collection spéciale.

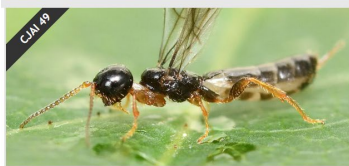


Canadian Journal of **ARTHROPOD IDENTIFICATION**

<https://cjai.biologicalsurvey.ca/>

A product of the **Biological Survey of Canada** & the **Entomological Society of Canada**

CJAI provides richly illustrated, peer-reviewed, open-access tools for identifying insects, arachnids and other arthropods in Canada. Try out these new keys on our updated [website!](#)



Key to the New World subfamilies of the family Braconidae (Hymenoptera)

Michael Sharkey,
Kacie J. Athey,
José L. Fernández-Triana,
Angélica Maria Pentead-Dias,
Spencer K. Monckton and
Donald L. J. Quicke



An illustrated identification key to Nearctic genera of Empidoidea (exclusive of Dolichopodidae sensu stricto) (Diptera)

Bradley J. Sinclair,
Scott E. Brooks and
Jeffrey M. Cumming

Advertising in the *Bulletin* / Publicité dans le Bulletin

The *Bulletin* welcomes enquiries regarding advertising within its pages.

For 2024, the advertising rates in the *Bulletin* have been set at \$260/annum for a half-page advertisement, and \$455/annum for a full-page advertisement, in each of the March, June, September and December issues.

For further information, please contact the *Bulletin* Editor (roitberg@sfu.ca).

Le *Bulletin* accueille les demandes de publicité dans ses pages.

Pour 2024, les tarifs publicitaires du *Bulletin* ont été fixés à 260 \$/an pour une demi-page et à 455 \$/an pour une page entière dans chacun des numéros de mars, juin, septembre et décembre.

Pour de plus amples informations, veuillez contacter le rédacteur du *Bulletin* (roitberg@sfu.ca).

List of Contents: Regional Journals / Table des matières : Revues des sociétés régionales

Contents of regional society journals

This regular feature highlights research published in the five regional society journals that include peer-reviewed papers. It should be noted that some regional society journals are not published on a regular basis and may not always include peer-reviewed articles.

Contenu des revues des sociétés régionales

Cette rubrique régulière met en lumière la recherche publiée dans les cinq revues des sociétés régionales qui incluent des articles révisés par les pairs. Veuillez noter que certaines revues des sociétés régionales ne sont pas publiées sur une base régulière et peuvent ne pas toujours inclure des articles évalués par les pairs.



Journal of the Entomological Society of Ontario Volume 154 (2023)

<https://journal.lib.uoguelph.ca/index.php/eso/issue/view/468>

Brodo, F., Jumean, Z. and Beresford, D. 2023. Crane flies (Diptera: Tipuloidea) of far northern Ontario and their distributions in the neighbouring regions of subarctic Canada. *Journal of the Entomological Society of Ontario*. 154: 27pp

Gleason, J.E., Maw, E., Summerfield, A., Jandricic, S.E., and Brunet, B. 2023. First records of invasive agricultural pests *Thrips parvispinus* (Karny, 1922) and *Thrips setosus* Moulton, 1928 (Thysanoptera: Thripidae) in Canada. *Journal of the Entomological Society of Ontario*. 154: 12pp

Huber, J. and Read, J.D. 2023. Review of *Gastrognatocerus ogloblin* (Hymenoptera: Mymaridae) in North America. *Journal of the Entomological Society of Ontario*. 154: 26pp

Skvarla, J., Poh, K., Norman, C., Struckhoff, E.D., and Machtinger, E. 2023. A comparison of European deer keds (Diptera: Hippoboscidae: *Lipoptena cervi* (Linnaeus)) and blacklegged ticks (Ixodida: Ixodidae: *Ixodes scapularis* Say) on elk (*Cervus canadensis* (Erleben)) and white-tailed deer (*Odocoileus virginianus* (Zimmermann, 1780)) in Pennsylvania. *Journal of the Entomological Society of Ontario*. 154: 13pp





Canadian Weed Science Society
Soci t  canadienne de malherbologie

CWSS-SCM Newsletter

The Society has adopted a new style for its newsletter so that there is no longer a Table of Contents. To see what's new in Canadian weed science since the last *Bulletin*, go to: <https://weedsociety.ca/newsletters/>

June 2023

<https://c8x545.p3cdn1.secureserver.net/wp-content/uploads/2023/06/6June-2023-newsletter.pdf>

July 2023

<https://c8x545.p3cdn1.secureserver.net/wp-content/uploads/2023/07/7July-2023-newsletter.pdf>





THE CANADIAN PHYTOPATHOLOGICAL SOCIETY
LA SOCIÉTÉ CANADIENNE DE PHYTOPATHOLOGIE

CPS-SCP News
VOL. 67, NO. 2 (June 2023)

<https://phytopath.ca/wp-content/uploads/2023/10/CPS-SCP-News-67-3-September2023.pdf>

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Meeting announcements / Réunions futures

The Impact of Extreme Events

Royal Entomological Society Hybrid Symposium

London, England, 25 April 2024

<https://www.royensoc.co.uk/event/the-impact-of-extreme-events/>

National Conference on Urban Entomology

Mobile, Alabama, 19-22 May 2024

<https://ncue.tamu.edu/>

Canadian Society for Ecology and Evolution

Vancouver, BC 26-29 May 2024

<https://csee-scee2024.ca/en/>

Third International Congress of Biological Control (ICBC3)

San Jose, Costa Rica, 24-27 June 2024

www.IOBC-ICBC.com

XVII International Conference on Ephemeroptera and XXI International Symposium on Plecoptera

Turin, Italy, 21-26 July 2024

<http://ijmep2024.com/>

XXVII International Congress of Entomology / Le XXVII International Congress of Entomology

Kyoto, Japan, 25-30 August 2024

<https://ice2024.org>

Entomology 24 (Annual Meeting of the Entomological Society of America)

Phoenix Arizona, 10-13 November 2024

<https://entsoc.org/entomology2024>

Entomology 25 (Annual Meeting of the Entomological Society of America)

Portland, Oregon, 9-12 November 2025

Readers are invited to send the Bulletin Editor notices of entomological meetings of international, national or Canadian regional interest for inclusion in this list.

Les lecteurs sont invités à envoyer au rédacteur en chef des annonces de réunions entomologiques internationales, nationales ou régionales intéressantes afin de les inclure dans cette liste.

Bulletin of the Entomological Society of Canada

Editor: Bernard Roitberg
Assistant Editor: Donna Giberson

The *Bulletin of the Entomological Society of Canada*, published since 1969, presents quarterly entomological news, opportunities and information, details of Society business, matters of wider scientific importance and book reviews.

Published by the
Entomological Society of Canada
386 Broadway, Suite 503
Winnipeg, MB R3C 3R6
E-mail: info@esc-sec.ca
www.esc-sec.ca/

The Entomological Society of Canada was founded in 1863 primarily to study, advance and promote entomology. It supports entomology through publications, meetings, advocacy and other activities.

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ISSN: 0071-0741

Contents copyrighted 2023 by the Entomological Society of Canada

Submission deadline for the next issue: 31 January 2024



Bulletin de la Société d'entomologie du Canada

Rédacteur: Bernard Roitberg
Rédactrice adjointe: Donna Giberson

Le *Bulletin de la Société d'entomologie du Canada*, publié depuis 1969, présente trimestriellement des informations entomologiques, des occasions, des renseignements sur les opérations de la Société, des dossiers scientifiques d'importance et des analyses d'ouvrages.

Publié par la
Société d'entomologie du Canada
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Winnipeg, MB R3C 3R6
E-mail: info@esc-sec.ca
www.esc-sec.ca/fr/

La Société d'entomologie du Canada a été établie en 1863 principalement pour promouvoir l'étude et l'avancement de l'entomologie. Elle soutient l'entomologie par l'entremise de publications, de réunions et d'autres activités.

Envoyer vos soumissions à:
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ISSN: 0071-0741

Droits d'auteur 2023 Société d'entomologie du Canada

Date de tombée pour le prochain numéro: 31 janvier 2024

Affiliated Societies and Other Organizations, 2023-2024

Sociétés affiliées et autres organisations, 2023-2024

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Editor's note: Society Directors and Officers are reminded to check these lists, and submit corrections, including the names and positions of new officers.



Hello Bulletin, it's me, BernieBot

In their famous rendering of the British folk song, Greensleeves (Tyner, 1961), there is a point at which McCoy Tyner and John Coltrane build an almost unbearable tension that is finally released by their virtuoso response to one another—their 1961 version of that song is considered a jazz classic to this day.

Why am I telling you this? My point is, any competent musician can play Greensleeves but only a true artist can render this pleasant folk song into something of splendour. And so it is for the true scientist when building a narrative of their work.

You probably saw this one coming, a short discourse on the use of artificial intelligence for 'writing' scientific papers. I am going to contend that AI can be a very useful aid or digital assistant when it comes to writing scientific papers, but it should not and hopefully never will replace us as communicators for our scientific work.

Let me first state what I mean by an AIBot. I follow the IBM definition (<https://www.ibm.com/topics/chatbots>): A chatbot is a computer program that uses **artificial intelligence** (AI) and **natural language processing** (NLP) to understand customer questions and automate responses to them, simulating human conversation.

Bonjour Bulletin, c'est moi, BernieBot

Dans leur célèbre interprétation de la chanson folklorique britannique, Greensleeves (Tyner, 1961), il y a un moment où McCoy Tyner et John Coltrane créent une tension presque insoutenable qui est finalement libérée par leur réponse virtuose l'un à l'autre - leur version de 1961 de cette chanson est considérée comme un classique du jazz à ce jour.

Pourquoi vous dis-je cela ? Ce que je veux dire, c'est que n'importe quel musicien compétent peut jouer Greensleeves, mais seulement les artistes authentiques peuvent transformer cette agréable chanson folklorique en quelque chose de splendide. Il en va de même pour les véritables scientifiques lorsqu'il s'agit d'élaborer le récit de leurs travaux.

Vous l'avez probablement vu venir, un petit discours sur l'utilisation de l'intelligence artificielle pour « écrire » des articles scientifiques. Je vais soutenir que l'IA peut être une aide très utile ou un assistant numérique lorsqu'il s'agit de rédiger des articles scientifiques, mais qu'elle ne devrait pas et, je l'espère, ne remplacera jamais les communicateurs que nous sommes pour notre travail scientifique.

Permettez-moi tout d'abord de préciser ce que j'entends par AIBot. Je suis la définition d'IBM (<https://www.ibm.com/topics/chatbots>) : Un chatbot est un programme informatique qui utilise **l'intelligence artificielle** (IA) et le **traitement du langage naturel** (NLP) pour comprendre les questions de la clientèle et automatiser les réponses à ces questions, en simulant une conversation humaine¹. Plus précisément, les chatbots IA utilisent la compréhension du langage naturel (NLU) pour discerner le besoin de l'utilisateur. Ils utilisent ensuite des outils

¹Traduction libre de la définition anglaise

More specifically, AI chatbots use natural language understanding (NLU) to discern the user's need. Then they use advanced AI tools to determine what the user is trying to accomplish.

AI chatbots like ChatGPT are excellent at collecting and summarizing information but, to quote Slavango et al. (2023, p. 2), "Importantly, the writing process of a scientific paper requires, for the moment, the guidance and supervision of human researchers who are experts in the field to ensure the accuracy, coherence, and credibility of the content before being used or submitted for publication. Chatbots can help but needs the researcher's input, and inadequate inputs would lead to inadequate results. For this reason, chatbots and AI, in general, should not replace human researcher's expertise, judgment, personality, and, in the end, responsibility." (If ever there was ever a case to be made for human judgement, see the recent case where Microsoft's algorithmic techniques were employed to develop an article highlighting the Ottawa Food Bank as a tourist destination (Peters 2023)).

I am reminded of the introduction of PowerPoint (PPT) into scientific meetings. The first thing that I noticed was that speakers often attempted to incorporate all of PPT's bells and whistles into their talks. Do you remember those talks that employed nearly every colour of the spectrum into each and every slide along with those distracting little gifs flying back and forth? Thankfully, speakers got smarter over time and tamped down on those distractions. But the main point I want to make is that PPT is an organizing tool and it was designed to help people build compact, coherent talks. Given its nearly universal acceptance, rarely now do we witness unorganized, illegible talks. So, PPT raises the floor, but does it raise the ceiling? Not really. And, why not? Because PPT is a kind of digital cookie cutter. By contrast, what makes

d'IA avancés pour déterminer ce que l'utilisateur essaie d'accomplir.

Les chatbots IA comme ChatGPT sont excellents pour collecter et résumer des informations mais, pour citer Slavango et al. (2023, p.2), « Il est important de noter que le processus de rédaction d'un article scientifique nécessite, pour le moment, l'orientation et la supervision de chercheurs humains qui sont des experts dans le domaine afin de garantir l'exactitude, la cohérence et la crédibilité du contenu avant qu'il ne soit utilisé ou soumis à la publication. Les chatbots peuvent aider, mais ils ont besoin de l'apport du chercheur, et des apports inadéquats conduiraient à des résultats inadéquats. C'est pourquoi les chatbots et l'IA, en général, ne devraient pas remplacer l'expertise, le jugement, la personnalité et, en fin de compte, la responsabilité des chercheurs humains. »²² (Si jamais il y avait un argument en faveur du jugement humain, voir le cas récent où les techniques algorithmiques de Microsoft ont été utilisées pour développer un article présentant la Banque alimentaire d'Ottawa comme une destination touristique (Peters 2023)).

Je me souviens de la venue de PowerPoint (PPT) dans les réunions scientifiques. La première chose que j'ai remarquée, c'est que les conférenciers tentaient souvent d'intégrer toutes les fonctionnalités de PPT dans leurs exposés. Vous souvenez-vous de ces exposés qui utilisaient presque toutes les couleurs du spectre dans chaque diapositive, ainsi que ces petits gifs distrayants qui circulaient d'un côté à l'autre? Heureusement, les conférenciers sont devenus plus intelligents avec le temps et ont réduit ces distractions. Mais ce que je veux surtout souligner, c'est que PPT est un outil d'organisation et qu'il a été conçu pour aider les orateurs à construire des exposés compacts et cohérents. Compte tenu de son acceptation quasi universelle, il est rare que nous assistions aujourd'hui à des exposés désorganisés et illisibles. Donc, PPT élève le niveau, mais élève-t-il le plafond? Pas vraiment. Et pourquoi? Parce que PPT est une sorte d'emporte-pièce numérique. En revanche, ce qui fait un grand

²²Traduction libre de la citation anglaise

for a great talk isn't the organization but rather the telling of a compelling story that charts new territory and makes us think differently about the world we live in—cookie cutters are not designed to do that. AI chatbots are like everything-everywhere-all-at-once PPTs but they still are cookie cutters; they need us to prompt the enterprise.

So, how might one use a chatbot? We might use it to efficiently search the literature based upon similarities or concepts (and not just keywords) (✓), ask it to organize those references into a coherent assemblage (✓), help define a research question and, in general, improve articulation (✓), help organize an initial draft (✓), use it as a grammar checker (✓) and write our papers for us and thus increase our publication rate (X).

As to the latter use, one might be tempted to ask a chatbot to write all those papers that we never seem to have the time to author ourselves but beware, and here is the difficulty—as scientists, we are asked to write with clarity and precision but to write a really exciting paper requires that we go beyond the data, that we draw together seemingly-disparate concepts into new constructs, etc. without relaxing that precision, something that chatbots are not designed to do. It is my contention that novel, breakthrough publications will continue to come from authors thinking very hard and outside of the box about the natural world even if they employ AI to help them articulate those thoughts; there are no shortcuts to excellence.

I close with a few simple questions: Would an unsupervised ChatGTP ever choose to build a rendering of Greensleeves that would rival that of John Coltrane's version in terms of creativity, nuance and virtuosity? At this point in time, that is no more likely than Data spontaneously telling a joke on Star Trek. Could a BernieBot write The Last Word and how do you know that it hasn't

exposé, ce n'est pas l'organisation, mais plutôt la narration d'une histoire captivante qui explore de nouveaux territoires et nous fait réfléchir différemment sur le monde dans lequel nous vivons - les emporte-pièces ne sont pas conçus pour cela. Les chatbots d'IA ressemblent à PPT tout partout-tout de suite, mais ils sont encore à l'emporte-pièce; ils ont besoin de nous pour inciter l'entreprise à les utiliser.

Alors, comment utiliser un chatbot? Nous pourrions l'utiliser pour rechercher efficacement la littérature sur la base de similitudes ou de concepts (et pas seulement de mots-clés) (✓), lui demander d'organiser ces références en un ensemble cohérent (✓), nous aider à définir une question de recherche et, en général, améliorer l'articulation (✓), aider à organiser une première version (✓), l'utiliser comme correcteur grammatical (✓) et écrire nos articles pour nous et ainsi augmenter notre taux de publication (X).

En ce qui concerne cette dernière utilisation, on pourrait être tenté de demander à un chatbot d'écrire tous ces articles que nous ne semblons jamais avoir le temps de rédiger nous-mêmes, mais attention, et c'est là que réside la difficulté - en tant que scientifiques, on nous demande d'écrire avec clarté et précision, mais pour rédiger un article vraiment passionnant, il faut aller au-delà des données, rassembler des concepts apparemment disparates en de nouvelles constructions, etc. sans relâcher cette précision, ce que les chatbots ne sont pas conçus pour faire. Je suis d'avis que les publications novatrices et révolutionnaires continueront d'émaner d'auteurs(e)s qui réfléchissent très sérieusement et hors des sentiers battus sur le monde naturel, même s'ils emploient l'IA pour les aider à articuler ces pensées; il n'y a pas de raccourci vers l'excellence.

Je termine par quelques questions simples: un ChatGTP non supervisé choisirait-il un jour de créer une interprétation de Greensleeves qui rivaliserait avec la version de John Coltrane en termes de créativité, de nuances et de virtuosité? À l'heure actuelle, cela n'est pas plus probable que Data racontant spontanément une blague dans Star Trek. Un BernieBot pourrait-il écrire Le dernier mot et comment savoir s'il ne l'a pas

already? Are your jobs safe; will your boss choose to replace you with a bot anytime soon? Scary, yes, but maybe, just like our experience with PPT, people will learn to apply chatbots in the best ways possible; it's just a matter of time.

Happy holidays.

Bernie (not BernieBot)

déjà fait? Vos emplois sont-ils en sécurité? Votre patron choisira-t-il de vous remplacer par un robot dans un avenir proche? Effrayant, oui, mais peut-être que, tout comme notre expérience avec PPT, les gens apprendront à utiliser les chatbots de la meilleure façon possible; ce n'est qu'une question de temps.

Joyeuses fêtes!

Bernie (et non BernieBot)

References/ Références

- Peters, J. 2023. Microsoft says listing the Ottawa Food Bank as a tourist destination wasn't the result of 'unsupervised AI'. The Verge, <https://www.theverge.com/2023/8/17/23836287/microsoft-ai-recommends-ottawa-food-bank-tourist-destination>
- Slavango, M., Taccone, F.A. and Gerli, A.G. 2023. Can artificial intelligence help for scientific writing? *Critical Care*, 27:75. <https://doi.org/10.1186/s13054-023-04380-2>
- Tyner, M. 1961. Greensleeves. Traditional arranged by McCoy Tyner. Africa Brass, Impulse.



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Front cover/Page couverture:

1. Caterpillar of the lobster moth, *Stauropus fagi* (Lepidoptera, Notodontidae), Delémont, Switzerland.
Chenille du bombyx du hêtre, *Stauropus fagi* (Lepidoptera, Notodontidae), Delémont, Suisse.
Photo: Tim Hays
2. Female *Physocephala tibialis* (Diptera, Conopidae) with three males trying to claim her. Brampton, Ontario.
Femelle *Physocephala tibialis* (Diptera, Conopidae) avec trois mâles essayant de la revendiquer. Brampton, Ontario.
Photo: Bob Noble
3. Brown Wasp Mantidfly (*Climaciella brunnea*, Neuroptera, Mantispidae) Locality: Municipality of Bifrost, Manitoba, Canada.
Mantispidé brun (*Climaciella brunnea*, Neuroptera, Mantispidae).
Localité : Municipalité de Bifrost, Manitoba, Canada.
Photo: Thilina Hetti Arachchige
4. Damselfly (Odonata, Coenagrionidae) taken in Burnaby, BC.
Demoiselle (Odonata, Coenagrionidae) prise à Burnaby, C.-B.
Photo: Taiga Morris
5. A weevil (*Curculio* sp., Coleoptera, Curculionidae) with its remarkably long snout, was drilling a hole through the ostiole of fig fruit (*Ficus benghalensis*) to lay its eggs inside the fruit. Kolkata, West Bengal, India.
Un charançon (*Curculio* sp., Coleoptera, Curculionidae) avec son museau remarquablement long, perceait un trou à travers l'ostiole du fruit de la figue (*Ficus benghalensis*) pour pondre ses œufs à l'intérieur du fruit. Kolkata, Bengale occidentale, Inde.
Photo: Supratim Laha
6. Masses of Small Square-gilled Mayflies (*Caenis* sp., Ephemeroptera, Caenidae) at light, Boone River, Iowa.
Masses de petites éphémères (*Caenis* sp., Ephemeroptera, Caenidae) à la lumière, Boone River, Iowa.
Photo: Gregory Courtney

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Date of issue: December 2023 /
décembre 2023

ISSN: 0071-0741

Back cover/Quatrième de couverture:

Ant woodlouse (*Platyarthus hoffmannseggii*, Isopoda, Platyarthridae). This blind, almost spectral-looking species of woodlouse lives exclusively within ant nests, where it feeds on detritus. The ants don't seem bothered by them, as the woodlice rush around keeping their host's nests clean of decaying organic material. Bristol, United Kingdom.
Le cloporte des fourmis (*Platyarthus hoffmannseggii*, Isopoda, Platyarthridae). Cette espèce de cloporte aveugle, à l'aspect presque spectral, vit exclusivement dans les nids de fourmis, où elle se nourrit de détritus. Les fourmis ne semblent pas être dérangées, car les cloportes s'empressent de nettoyer les nids de leurs hôtes des matières organiques en décomposition.
Bristol, Royaume Un.
Photo: Frank Ashwood